The IRON AGE

March 13, 1958 A Chilton Publication The National Metalworking Weekly

Special Survey Report:

What You Should Know About Tensions And Business P. 75

Has Automation Upgraded Steel Labor? – P. 61

How to Stop Bolt Fatigue Failures – P. 105

Digest of the Week P. 2-3

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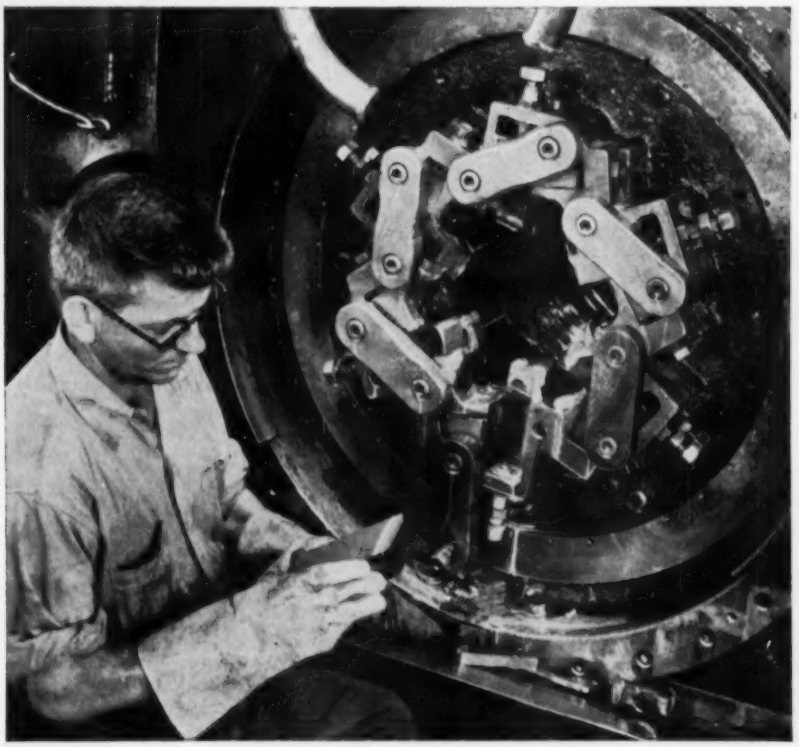
Tool Steel Topics

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

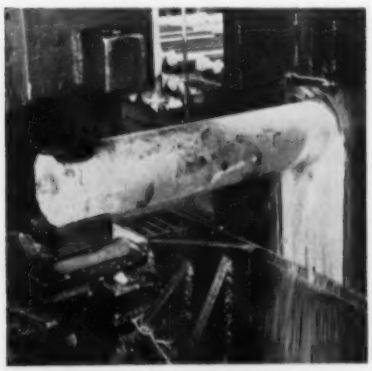
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation



Nickel Billets Get Close Shave with Tools of 66 High-Speed

Biting into billets, castings or forgings of nickel or nickel alloy is one of the toughest assignments ever devised for tool steel. And yet, such jobs are taken in stride with Bethlehem high-speed tool steel at the plant of International Nickel Co., Huntington, W. Va.



Bar peeler cutters, made of 66 High-Speed tool steel, prepare nickel surface for extrusion.

The bar peeler cutters, in the picture above, are hardened to Rockwell C 60-62, and are used in the surface preparation of nickel billets, prior to extrusion. Despite this extremely rugged operation, the cutters are doing an outstanding job, because of their unusual resistance to shock and wear.

66 High-Speed is ideal for all types of cutting applications because of its well-rounded 6-5-4-2 analysis. In addition to its outstanding shock and wear properties, it has excellent red-hardness and abrasion resistance — all the qualities needed for satisfactory high-speed cutting work.

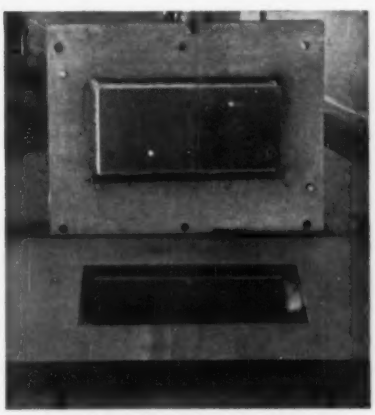
If you would like to learn more about 66 High-Speed, and the many jobs it can handle, simply get in touch with your friendly Bethlehem tool steel distributor.

BETHLEHEM TOOL STEEL ENGINEER SAYS:

Overloading of Machines Shortens Tool Life

Overloading of machine tools is detrimental not only to the machines, but also to the life of the tools. Overloads cause excessive deflection of the constructional members, which may cause misalignment of mating tools and change calculated clearances. This in turn may produce excessive wear on the tools, and may result in defective parts or premature tool breakage.

Overloading frequently results from performing an excessive number of operations at one time, such as multiple piercing of holes. Overloads of this type can be prevented without changing the work to be done by providing, (1) shear on either the punch or die to reduce the maximum punching load, or, (2) by staggering punch heights so that the multiple operations are performed in sequence, instead of all at the same time.



UP TO 30,000 CONVEYOR PANELS WITH DIE OF 67 CHISEL

This large blanking die was employed in the production of conveyor panels, made from 14-gage sheet steel. It was hardened to Rockwell C-50, and turned out as many as 30,000 pieces before redressing was required. 67 Chisel is our popular chrome-tungsten type of shock-resisting tool steel. In addition to its use in blanking, it's excellent for hot-work tools, shear blades, and swaging dies. Give it a try.

THE IRON AGE
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The IRON AGE

March 13, 1958—Vol. 181, No. 11

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STEEL PAY RATES

Automation's Challenge Met—The steel industry's job classification system was set up over a decade ago. Yet it is still working smoothly

despite the impact of automation. Worker responsibility is a key factor in setting base pay rate. P. 61

ALUMINUM ALLOYS

Growing Pains—Aluminum-magnesium alloys are overcoming early problems. New welding techniques put them on a par in fabricating costs. Companies' own products overlap and duplicate in 5000 series. P. 64

REPORT TO MANAGEMENT

Unemployment Story — Figures on unemployment show how hard hit the durable goods industries are. Since a year ago, 80 pct of the increase in unemployment has been in this sector. P. 73

TAX CUT PROSPECTS

A Flat Sum—Washington talk now favors a flat $50 per person

Metalworking

BUSINESS TENSIONS: Are tensions getting you down? This week's Survey Report to Management documents causes of tensions, pinpoints tension-building habits. It includes an authoritative recommendation of how you can deal with your tensions. P. 75

tax cut. Treasury Dept. feels revenue loss would reach $3.5 billion. Some politicians doubt voter appeal. P. 89

MACHINE TOOLS

Patriotic Promotion Due—Members of the American Machine Tool Distributors' Assn. are urged to affix a red, white, and blue nameplate to machines they sell and install. It's a drive for wider recognition of U. S. tools. P. 93

FEATURE ARTICLES

STOP FATIGUE FAILURES

With Tight Bolts—It's looseness that causes more than 75 pct of all threaded-fastener failures. Apply a preload and maintain it greater than any service load a fastener will meet and there can be no fatigue failure. To get maximum bolt strength, it's important to observe several vital rules. P. 105

BRAZING FIXTURES

Resist High Heat—The problem is to find a material that won't warp, distort, oxidize, or allow molten brazing alloy to weld assembly to the fixture. Ceramic tooling is a good choice for this precision job. P. 109

CARE OF OIL SEALS

For Longer Bearing Life—The life-blood of any modern machine is the oil that lubricates its bearings. Guarding the supply against loss or contamination is the job of oil seals. It's here that careful maintenance will insure longer bearing life. P. 110

TO WELD ALUMINUM

New Pore-Free Ways—Aimed at eliminating porosity, three new metal-inert-gas welding methods not only solve porosity problems, but also do away with dross in welds. Lower costs is another virtue claimed. P. 112

MODEL STUDIES

Pretest Gas Flow—Bring gas to a dust precipitator without turbulence and you can increase efficiency and capacity of the unit. Transparent plastic models can eliminate costly changes in full-scale installations. P. 116

MARKETS & PRICES

CONTINUOUS CASTING

Copper Cakes—Continuous casting plus arc melting is producing tough pitch copper cakes up to 25 ft long and weighing 50 tons. Asarco Perth Amboy plant does it. P. 63

QUICKSILVER

Government Program—Congress has authorized a buying program to support the domestic mercury industry. But GSA requirements on the type of flask to be used almost nullifies the entire program. P. 66

INDUSTRIAL DEVELOPMENT

Push at San Bernardino—Heavy industry will find the welcome mat is out if they go west to San Bernardino County. Developers there stress area's nearness to growing markets, its mineral deposits, climate, and good living conditions. P. 91

STEEL TENTER HOOK

Market Uncertainty—Steel men are shifting from one foot to the other. The pickup in orders from small users gives them hope. But big consumers are dragging their feet. P. 155

PRESS BUYING

Prices Spur Activity—While still cautious, some press purchasers are going into the market. The present competitive prices are proving sales stimulant too strong to resist. P. 156

NEXT WEEK

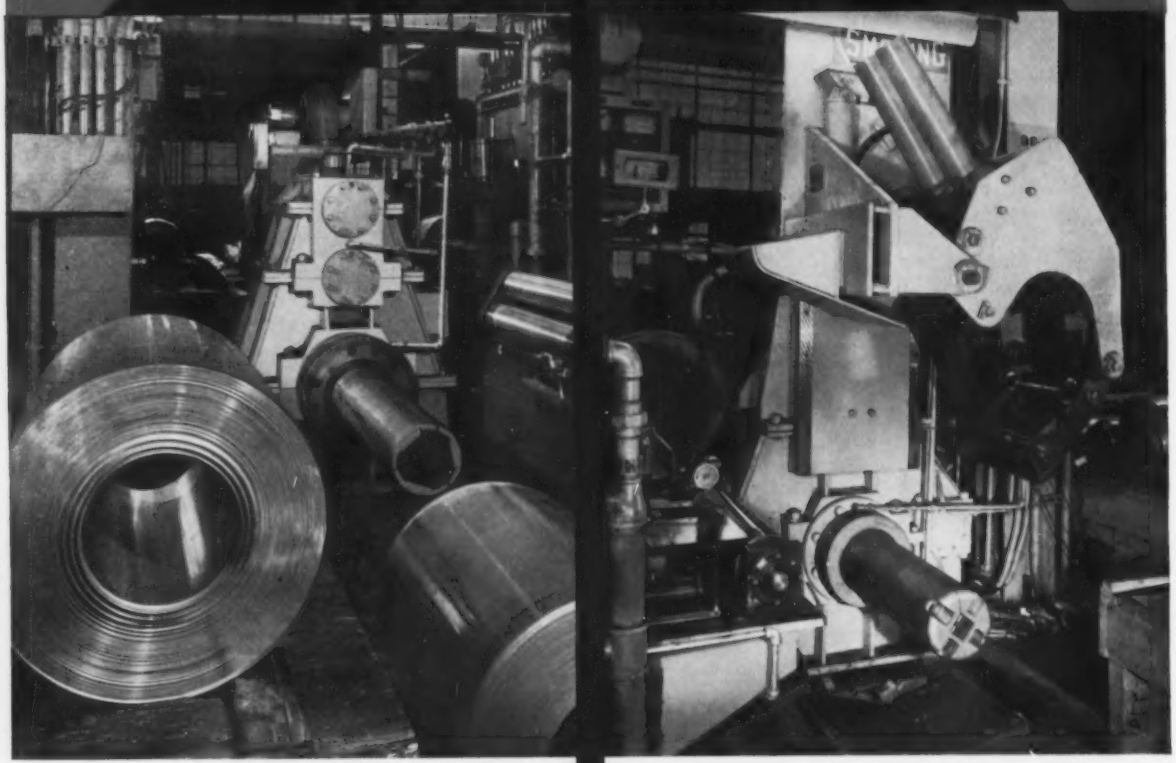
SELLING A COMPANY

It Takes Planning—There's a lot more to selling a business than agreeing on price. The long range interests of the company must be protected. Next week, W. C. Denison explains the many precautions he took before selling his firm.

Auxiliary Equipment

by Pittsburgh

4 HIGH COLD ROLLING MILL



Mandrel Type Payoff Reel

Tension Reel and Belt Wrapper

The auxiliary equipment illustrated above is representative of numerous installations designed and built by Pittsburgh in many leading metal fabricating plants. Consult us for your ferrous or non-ferrous mill equipment requirements—from major mill construction to small auxiliary jobs.

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AFTER BRUSHING—
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HERE'S HOW IT'S DONE—*Simple, double-end brushing machine, using Osborn Master® Wheel Brushes, has two power heads and central conveyor. Heads are adjustable to handle deburring and edge-blending of various tube lengths.*

HERE'S how rough end-burrs are quickly, easily removed from metal components—and how this manufacturer does the job up to *400% faster with Osborn Power Brushing.*

After the rough cut-off operation, cylindrical parts—like these tubes for example—are simply fed through a hopper . . . past rotating Osborn Brushes.

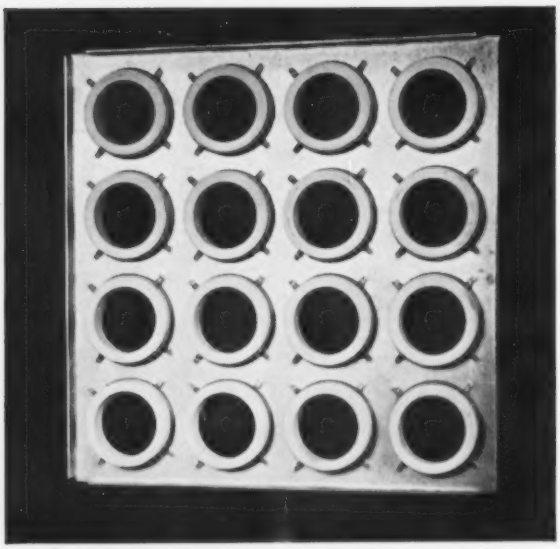
As the tubes are rotated by the action of the brushes, all burrs are thoroughly removed . . . tube ends are smoothly, uniformly blended.

In many cases, product quality is greatly improved at the same time costs are being cut with Osborn Power Brushing. An **O**sborn **B**rushing **A**nalysis made on *your production* can show where and how you can save money today, too. Write *The Osborn Manufacturing Company, Dept. F-67, Cleveland 14, Ohio.*

Osborn Brushes

BRUSHING MACHINES • BRUSHING METHODS • POWER, PAINT AND MAINTENANCE BRUSHES • FOUNDRY PRODUCTION MACHINERY

How Armco ALUMINIZED STEEL Helps Electrical Resistors Fight Heat

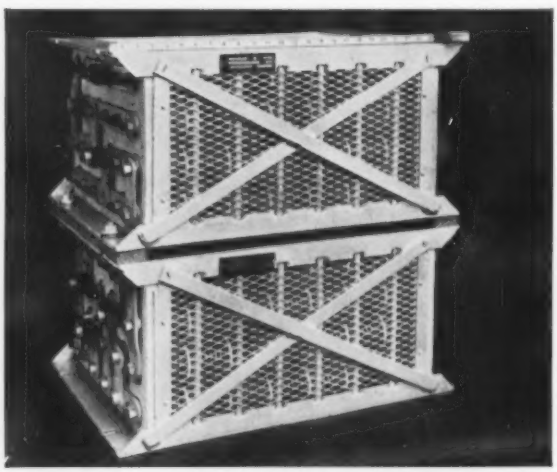


These high-temperature electrical resistors get **hot.** So every resistor part must resist heat. That's why Armco ALUMINIZED STEEL replaced aluminum-painted carbon steel for coil supports.

A leading manufacturer of electrical resistors for mine locomotives and mill cranes formerly made coil supports from carbon steel protected with aluminum paint. At high temperatures the paint flaked off, causing resistors to fail.

But such premature failures ended when the manufacturer switched to Armco ALUMINIZED STEEL for coil supports. The reason is the *hot-dip coating of aluminum* on ALUMINIZED STEEL. It alloys with the steel base... forms a refractory layer that doesn't flake off at temperatures up to 1250 F.

If heat, or a combination of heat and corrosion, cuts service life of your products, Armco ALUMINIZED STEEL Type 1 offers you this same positive protection. Just fill in and mail the coupon or contact your nearest Armco Sales Office for full information.



Other Armco Steels for top-quality products include ALUMINIZED STEEL Type 2, Stainless Steels, ZINCGRIP®, ZINCGRIP PAINTGRIP®, Cold-Rolled PAINTGRIP, Enameling Iron, Electrical Steels, Steel Tubing, Long Ternes, and high-quality Hot- and Cold-Rolled Sheets.

ARMCO STEEL CORPORATION
1508 Curtis Street, Middletown, Ohio

PLEASE SEND complete information about Armco ALUMINIZED STEEL Type 1. We make_____

NAME_____ TITLE_____

FIRM_____

STREET_____

CITY_____ ZONE____ STATE_____

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SHEFFIELD DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

Whose Ox Is Being Gored? Certainly No Congressman's

Long ago there was a song which went: "Who takes care of the caretaker's daughter while the caretaker is busy taking care?" Today maybe it should go, "Who's investigating the investigator while the investigator is investigating?"

Congressional investigations have their place —and responsibility. No one wants them eliminated. But a lot of people cringe when they see august committees being used as political sounding boards—or worse.

Old time politicians—and new ones too—say this is reality, that it's human nature and that anyone who can't see that is naive. This is said in private, however, not for the record.

All this may be true—and probably is. But how far should congressmen and senators be allowed—by their own members—to go spouting off with demagogic invective and personal spleen? Should the "club" always protect them?

At any rate, businessmen are no longer taking it lying down. They are shouting back, slamming back, and using the same picturesque language used by the investigators. That's one way of showing up half truths, innuendoes, holier-than-thou attitudes and rank bushwa.

Maybe congressmen and senators know their more vociferous members don't mean all they say, but do the people who read the papers know that? What redress—if any—has a man or his company when he or his company is shown in as ugly a light as possible? Defense isn't nearly as glamorous as attack—unless a great lawyer is defending an "underdog."

Judges, congressmen, senators, lawyers and some other professional people don't always look at tirades, baiting, guff and flag-waving in the same way that the man on the street does. Professional people often applaud excellent "performances" and feel let down with mediocre "acting."

So if a man or his company is pilloried and it is done with flourish, bounce and cunning strategy, the galleries—and the pros—love it. But what happens to the name that man or company has tried to build up with what they thought was acceptable, fair and responsible behavior?

That's why Roger Blough, U. S. Steel chairman, castigated quickly and sharply the off-the-cuff and before-the-report publicity remarks of Senator Kefauver on steel prices and monopoly. For Mr. Blough to have done less would have let innuendoes and fancies appear as facts.

Tom Campbell

Editor-in-Chief

GOODYEAR INDUSTRIAL PRODUCTS
G.T.M.-Specified
HYSUNITE Acid Hose
C
B
A
A Seamless tube of special synthetic rubber compound resists high concentrations of sulphuric, nitric and chromic acids at temperatures up to 100° F.
B Multiple plies of fabric reinforcement provide strength with maximum of flexibility
C Tough rubber cover resists abrasion and weather

Passes acid test—by more than 3 times

Unloading carloads of concentrated sulphuric acid proved a hose-killing job at this Gulf state fertilizer plant. Time after time, the acid charred the insides of a hose, making it brittle and easy to break. Even the best one could handle only 2,800 tons before it gave up the ghost.

Then the G.T.M.—Goodyear Technical Man—suggested HYSUNITE Hose. It's specially developed to carry highly oxidizing acids—even in high concentrations and at high temperatures hose could never before handle. How did HYSUNITE do there? *At last report, it had unloaded 9,900 tons. And it looks good for many more.*

Here's one more proof, then, that hose problems just don't come too tough for the G.T.M. Put him to the acid tests—no matter what your hose need—by contacting your Goodyear Distributor—or writing:

Goodyear, Industrial Products Division,
Akron 16, Ohio

HYSUNITE HOSE by

GOODYEAR

THE GREATEST NAME IN RUBBER

Hysunite—T.M. The Goodyear Tire & Rubber Company, Akron, Ohio

IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*

Ingot Capacity

Sir—Please send me three reprints of the official steel ingot capacities by IRON AGE districts from your issue of Feb. 13.

The statistical data in your magazine is very compact and useful. Thank you for your fine presentation.—C. A. Clark, Cost Analyst, U. S. Steel Corp., Munhall, Pa.

Aircraft Boom

Sir—My faith in IRON AGE is shaken. For years I regarded your magazine as gospel. But on the cover of the Feb. 27 issue is a featured title, "Aircraft Booms Despite Missile Talk."

There is nothing in the article on p. 83 to support such a statement. Furthermore, nothing could be further from the truth. In case you don't know, employment in the aircraft industry dropped 40,000 between October and November and another 19,000 between November and December. And there is every indication that the decline has not yet stopped. Is this a boom? —Ruth Rosenwald, Bureau of Employment Security, U. S. Dept. of Labor, Washington.

▪ With a $7 billion backlog we'd say the aircraft business really isn't bad.—Ed.

Cost Control

Sir—Would you please send us your article on "Setting Up a Sound Cost Control Program" which appeared in the Dec. 12 issue. I think it will prove very interesting and helpful to us.—D. J. Ciarrone, Ind. Eng., Nelson Stud Welding, Lorain, Ohio.

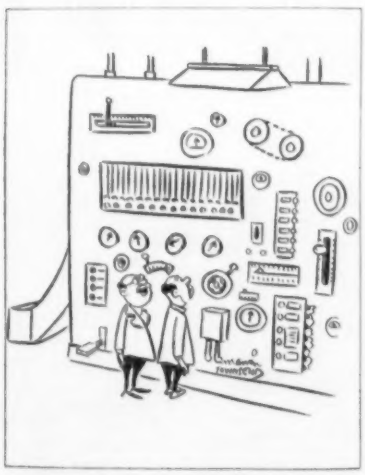
Sir—We thought your article on how to plan for lower costs was excellent. We should like to have two reprints of it.—E. H. Watkins, Div. Buyer, United States Gypsum Co., Chicago.

Rating Execs

Sir—Your survey report #10 . . . How To Rate Executives . . . does an excellent job in summarizing the latest thinking on this rather controversial subject. If available, I would appreciate receiving three additional copies of this splendid article.—P. Z. Kistler, Dir. of Relations, New York Wire Cloth Co., York, Pa.

Sir—The writer was very much interested in an article taking a realistic approach to rating programs, which appeared on pages 64 through 70 of the Jan. 30, 1958 IRON AGE. It would be greatly appreciated if you furnish me seven reprints of this article which you indicated are available. — G. E. Shubrooks, Chief Engineer, Hamilton Watch Co., Lancaster, Pa.

Sir—Would you please forward us a reprint of your feature article in the Jan. 30 issue of The IRON AGE entitled "What's Wrong With Executive Rating Programs?" We found the article very interesting.—P. L. Betsh, Friez Instrument Div., Bendix Aviation Corp., Towson, Md.



"They claim this new machine will do wonders. But we've never been able to find the starter button."

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a
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Draw?

Somers

has
an Ace
in
Unigrain®

To provide deep drawing thinstrip brass with increased tensile strength and elongation Somers installed the first high speed continuous annealer in the non-ferrous industry. This produces a much finer grain size than batch annealing with the result that only a single color buff is needed for a polished finish: heavy buffing and orange peel effect are eliminated, an additional saving in production time.
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Let's LAUGH a minute

Of course everyone knows that heat treating today has become one of the most serious technical and vital functions of the current metalworking activity. But a smile and laughter are still also important and the cartoons shown here are for that purpose.

We hope they make you grin and when it's heat treating services you require or skilled, technical advice about part design or heat treatability, check with

METAL TREATING INSTITUTE
271 NORTH AVENUE
NEW ROCHELLE, NEW YORK

or any member listed below.

Sound Familiar?
SARCASM. THE PRODUCTION MAN SCHEDULES A JOB THROUGH HIS PLANT WITH TIME TO WASTE!
LET'S SEE... PLENTY OF TIME FOR A GOOD JOB ON OPERATION 1... NUMBER 2 SHOULD BE ABLE TO QUIZ ALONG NICELY... AMPLE TIME FOR OPERATION NUMBER 3... THEN OUT IT GOES FOR HEAT TREATMENT
OPER. #1
OPER. #2
OPER. #3
BUT... WHEN THE HEAT TREATER GETS IT... IT'S IN AN AWFULLY GREAT HASTE!
SARCASM! HOW'S THAT JOB COMING? TIME'S RUNNING OUT!
FINE, BOSS! I GOT IT TO THE HEAT TREATER 10 MINUTES AGO, I'M CHECKING WITH THEM NOW!
HELLO! ABC HEAT TREATING? JOB? DO YOU REALIZE WE HAVE A TIGHT SCHEDULE? TRYING TO MAKE ME LOOK BAD, HUH?.. BLAH, BLAH, BLAH...
WHAT? NOT THROUGH WITH ONE JOB?

Sound Familiar?
CARELESS MILFRED IS NOT PARTICULAR ABOUT THE PARTS HE SENDS IN FOR HEAT TREATING
BUY!... TAKE A LOOK AT THIS CASTING!
... OFF SIZE, WICKED, CRACKED AND WHAT HAVE YOU. HOW DID IT EVER GET OUT OF THEIR PLANT... OR DON'T THEY CARE?
Justrite Heat Treating Co.
BUT... WHEN HE GETS THEM BACK... WHAM! LOOK WHO GETS THE BLAME!!
CALL YOURSELVES METAL TREATERS? HAH! YOU SURE GIVE OUR CASTINGS THE 'TREATMENT'! - THEY GO OUT OF HERE 100% PERFECT,... AND WHAT HAPPENS? DO YOU DROP 'EM OFF THE ROOF OR JUST RUN A TANK OVER THEM?.. IF YOU HAVE NO CONSIDERATION FOR A CUSTOMER'S PRODUCT I'LL JUST HAVE TO...

MTI
METAL TREATING INSTITUTE

American Metal Treatment Co.
Elizabeth, New Jersey

Anderson Steel Treating Co.
Detroit, Michigan

Benedict-Miller, Inc.
Lyndhurst, New Jersey

Bennett Heat Treating Co., Inc.
Newark 3, New Jersey

Commercial Metal Treating, Inc.
Bridgeport, Conn.

Cook Heat Treating Co. of Texas
Houston 11, Texas

The Dayton Forging & Heat Treating Co.
Dayton 3, Ohio

Dominy Heat Treating Corp.
Dallas, Texas

Drover Company
Philadelphia 33, Pennsylvania

Grossmon Steel Treating Company
Worcester 5, Massachusetts

Fred Heinzelman & Sons
New York 12, New York

Alfred Heller Heat Treating Co.
New York 38, New York

Hollywood Heat Treating Co.
Los Angeles 38, California

Ipsenlab of Rockford, Inc.
Rockford, Illinois

L-R Heat Treating Company
Newark, New Jersey

The Lakeside Steel Improvement Co.
Cleveland 14, Ohio

Metallurgical, Inc.
Minneapolis 14, Minnesota

Metallurgical, Inc.
Kansas City 8, Missouri

New England Metallurgical Corp.
South Boston 27, Massachusetts

Owego Heat Treat, Inc.
Apalachin, New York

Pasio Products Company
St. Louis 10, Missouri

Pittsburgh Commercial Heat Treating Co.
Pittsburgh 1, Pennsylvania

Pittsburgh Metal Processing Co., Inc.
Pittsburgh 15, Pennsylvania

The Queen City Steel Treating Co.
Cincinnati 25, Ohio

J. W. Rex Company
Lansdale, Pennsylvania

Stanley P. Rockwell Company
Hartford 12, Connecticut

Scott & Son, Inc.
Rock Island, Illinois

Standard Steel Treating Co.
Detroit 10, Michigan

Syracuse Heat Treating Corp.
Syracuse, New York

Temperature Processing Co.
North Arlington, New Jersey

Winton Heat Treating Company
Cleveland 10, Ohio

CANADA

Ipsenlab of Canada Ltd.
Toronto, Ontario

Ambidextrous Robot

From reader D. H. Reed, Detroit Tube Corp., comes a letter about the automatic golfing machine (see cut) which appeared in the Alan Wood Steel Co. ad in our January 30 issue.

He says he has often contemplated such a luxurious rig but "we fail to realize how a right handed machine can use the left handed clubs shown." To "avoid becoming a complete neurotic on golf," he asks for an explanation.

We have it direct from Alan Wood Steel Co. that the machine is ambidextrous. For right hand shots it uses clubs from a bag on the other side, behind the golfer. You just can't see it in this view.

Well, that's it, Mr. Reed, and congratulations on a sharp eye. We never thought of this angle either. Let's not underestimate the ingenuity of the steel companies—either in making steel, designing golfing machines—or answering letters.

How Many Billion?

Just had a memo from the editor. You might like to read it:

It has apparently become an inflexible rule that any mention of the word "radioisotopes" in print or in speeches must be followed by the phrase "which are currently saving American industry more than $500 million a year." We said it once in our pages; it is not inaccurate, but let's skip it in the future. Either that or start following every mention of the word "machine tool" with the phrase "which are currently saving American industry more than $500 trillion a year"—or you calculate the figure more exactly if you can.

The Market That Wasn't

One of our editors discovered while questioning marketing men for a story ("Aluminum Makers Push for Tonnage Markets," Iron Age, Feb. 27 issue) that good ideas can sometimes go awry.

He asked one aluminum sales executive if the industry had ever gone after a promising market only to have it fizzle out. There was a moment of silence. And then the honest admission that it had happened.

The market? Caskets. Aluminum's advantages? It's corrosion resistant, light in weight (a boon for pallbearers), it could be supplied in a variety of finishes, and an aluminum casket would be less expensive than those made of heavy woods.

It all seemed logical so our man asked what went wrong. It seems the barrier was psychological. The tradition behind the heavier casket was too much to overcome. It was preferred because of its solid feel and appearance.

New Puzzler

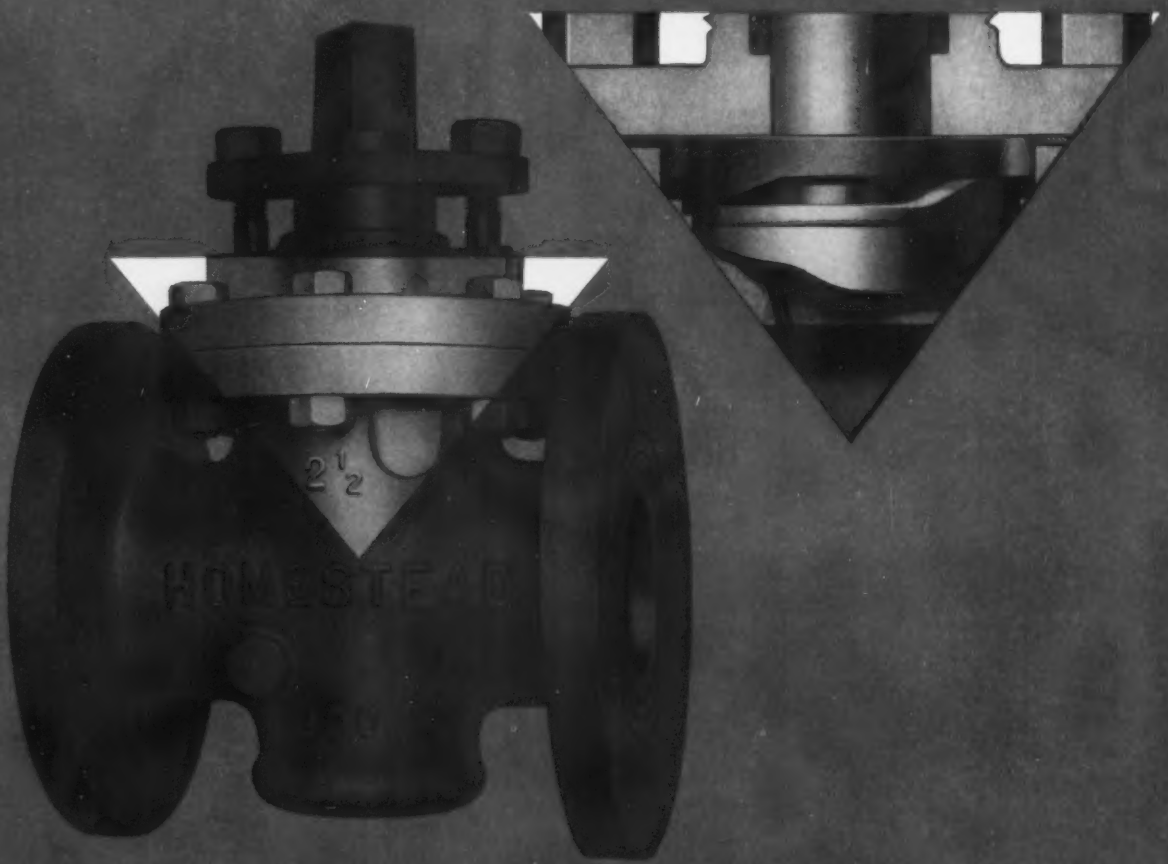
A man known to be a reckless driver was found in his garage early one morning, dead from a bullet. The only clues found anywhere around were two new, unsharpened pencils and two pairs of roller skate tracks that led from the garage along the driveway out to the cement sidewalk.

Who was the murderer and why did he commit the crime?

FLEXIBLE...
RUGGED...
TOUGH
From Gases To Granules
PENFLEX Moves 'em All
It expands, contracts, absorbs vibration. It withstands abrasion, exposure. That's Penflex Tubing . . . it's flexible . . . made of bronze, galvanized or stainless steel in sizes (1/8" to 24" I.D.) and types to meet your conveying needs. Pennsylvania Flexible Metallic Tubing Company, Inc., 7210 Powers Lane, Phila. 42, Pa.
"Flexineering" illustrates the science of engineering tubing to your specific job.
Get Your Copy
PENFLEX
TIGHT AS A PIPE BUT...
FLEXIBLE

In the spots that count... Homestead® Valves are

QUICK-ACTING



FASTER FLUID CONTROL is guaranteed by the quarter-turn action that fully opens or closes Homestead Cam-Seald Valves. A cam limits plug travel and automatically presses the matched seating surfaces of the plug and body together to form a leakproof, metal-to-metal seal. Additional design features such as the sealed bottom, seal between cap and body, the deep stuffing box, and the fact that fluid or grit cannot pass across the seating surface in the open or closed position, assure long, leak-free service. Write today for complete information—see how Homestead fills your needs.

h
v

HOMESTEAD VALVE MANUFACTURING COMPANY

P. O. Box 23 Coraopolis, Pa.

COMING EXHIBITS

Atom Fair '58 — March 17-21, International Amphitheatre, Chicago. (International Atomic Exposition, Architects Bldg., Phila. 3.)

Packaging Machinery and Materials Show — March 25-28, Convention Hall, Atlantic City, N. J. (Hanson & Shea, Inc., One Gateway Center, Pittsburgh 22.)

Industrial Development Show — Apr. 7-11, Coliseum, New York. (Woods, Donegan & Co., Inc., 48 West 48th St., New York 36.)

Design Engineering Show — April 14-17, International Amphitheatre, Chicago. (Clapp & Poliak, 341 Madison Ave., New York 17.)

Welding Show—Apr. 14-18, Kiel Auditorium, St. Louis. (Banner & Greif, 369 Lexington Ave., New York 17.)

Powder Metallurgy Show — April 21-23, Sheraton Hotel, Philadelphia. (Metal Powder Assn., 420 Lexington Ave., New York 17.)

Tool Engineers Show—May 1-8, Convention Hall, Philadelphia. (American Society of Tool Engineers, 10700 Puritan Ave., Detroit 38.)

Western Material Handling Show—May 8-10, Great Western Exhibit Center, Los Angeles. (Information: 2809 Sunset Blvd., Los Angeles 26.)

Southwestern Metal Show — May 12-16, State Fair Park, Dallas. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

Foundry Show—May 19-23, Public Auditorium, Cleveland. (American Foundrymen's Society, Golf & Wolf Rds., Des Plaines, Ill.)

MEETINGS

MARCH

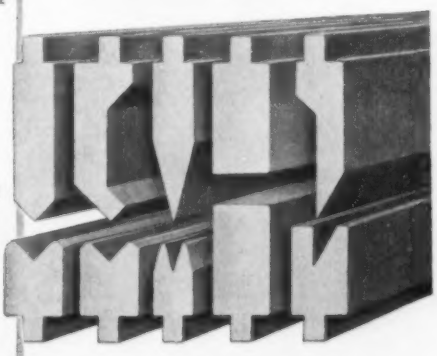
National Assn. of Waste Material Dealers, Inc.—Annual convention

(Continued on P. 16)

ALABAMA
Birmingham
Hinkle Supply Co., Inc.—Phone: 4-4541
CALIFORNIA
Los Angeles
Meyer Sheet Metal Mchry. Co.—VAn Dyke 1477
San Francisco
Harron, Rickard & McCone Co.—ATwater 2-2202
GEORGIA
Atlanta
Allison Mchry. Co.—JAckson 4-1741
INDIANA
Indianapolis
E. L. Humston Co., Inc.—WAlnut 5-9691
IOWA
Bonaparte
Corry's Machine & Tool Co.—Phone: 112
KANSAS
Wichita
Ellfeldt Mchry. & Supply Co.—AMherst 7-9773
MASSACHUSETTS
Cambridge
Austin-Hastings Co., Inc.—Kirkland 7-4480
MICHIGAN
Detroit
J. Lee Hackett Co.—TRinity 2-6442
MINNESOTA
Minneapolis
Minnesota Steel Supply Co.—FEderal 3-6273
MISSOURI
Kansas City
Ellfeldt Mchry. & Supply Co.—Victor 2-5494
NEW YORK
New York
Federal Machinery Corp.—CAnal 6-3022
Triplex Machine Tool Corp.—HAnover 2-4520
H. Weiss & Co.—CAnal 6-4256
NORTH CAROLINA
Greensboro
Armentrout Mchry. Co.—Phone: 4-8218
OHIO
Cincinnati
Cincinnati Mchry. Co., Inc.—TRinity 1-0853
Cleveland
George D. Miller Co.—MAin 1-1667
OKLAHOMA
Oklahoma City
Marshall Supply & Equip. Co.—REgent 9-0636
Tulsa
Marshall Supply & Equip. Co.—LUther 4-5275
OREGON
Portland
Pacific Metal Co.—CApitol 7-0693
PENNSYLVANIA
Philadelphia
Delaware Valley Mchry., Inc.—Willow Grove 4600
Milton Equipment Co.—WAlnut 2-1734
Pittsburgh
Wm. K. Stamets Co.—ATlantic 1-8091
TENNESSEE
Nashville
Pearl Equipment Co.—CHapel 2-5476
TEXAS
Dallas
Briggs-Weaver Mchry.Co.—LAkeside 8-0311
Fort Worth
Briggs-Weaver Mchry. Co.—EDison 6-5621
Houston
Mehl Machinery, Inc.—FAirfax 3-1313
WASHINGTON
Seattle
Pacific Metal Co.—MAin 6925
WISCONSIN
Eau Claire
Production Equip. Inc.—TEmple 2-3483
Milwaukee
F. W. Burns Mchry. Co.—FRanklin 4-1540
Production Equip. Inc.—GReenfield 6-6075

CANADA
A. R. Williams Machinery Co., Ltd.
ALBERTA
Calgary—Phone: 5-4425
Edmonton—Phone: 24341
BRITISH COLUMBIA
Vancouver—TAtlow 9411
Victoria—Phone: 4-7623
MANITOBA
Winnipeg—SPruce 4-4458
NOVA SCOTIA
Halifax—Phone: 5-4389
ONTARIO
Hamilton—JAckson 9-5388
Ottawa—CEntral 6-3661
Toronto—EMpire 4-2381
Windsor—CLearwater 4-4762
QUEBEC
Montreal—RIverside 8-9381

Off-the-shelf DELIVERY



CHICAGO®
*Induction Hardened** PRESS BRAKE DIES

This organization of local distributors offers immediate delivery on many CHICAGO *induction hardened* press brake dies. These stock dies are economical, and the quick delivery saves time in tooling. They are available in any length from 4 to 12 feet in increments of 2 feet.

Stock dies are used for a surprisingly large variety of bending operations. And, with CHICAGO *induction hardened* dies you get bonus performance and increased die life at no extra cost. Remember, these dies can be used in any make or size of standard press brake.

On your needs for press brake dies, call your nearest distributor listed here. With Bulletin D-457 you can order by number. Ask for a copy.

*Induction hardening is a special, high-frequency process used to harden the wear surfaces of CHICAGO dies. Field reports on CHICAGO *induction hardened* dies show up to ten times longer life than conventional press brake dies.

CHICAGO DREIS & KRUMP

Press Brakes, Press Brake Dies
Straight-Side-Type Presses

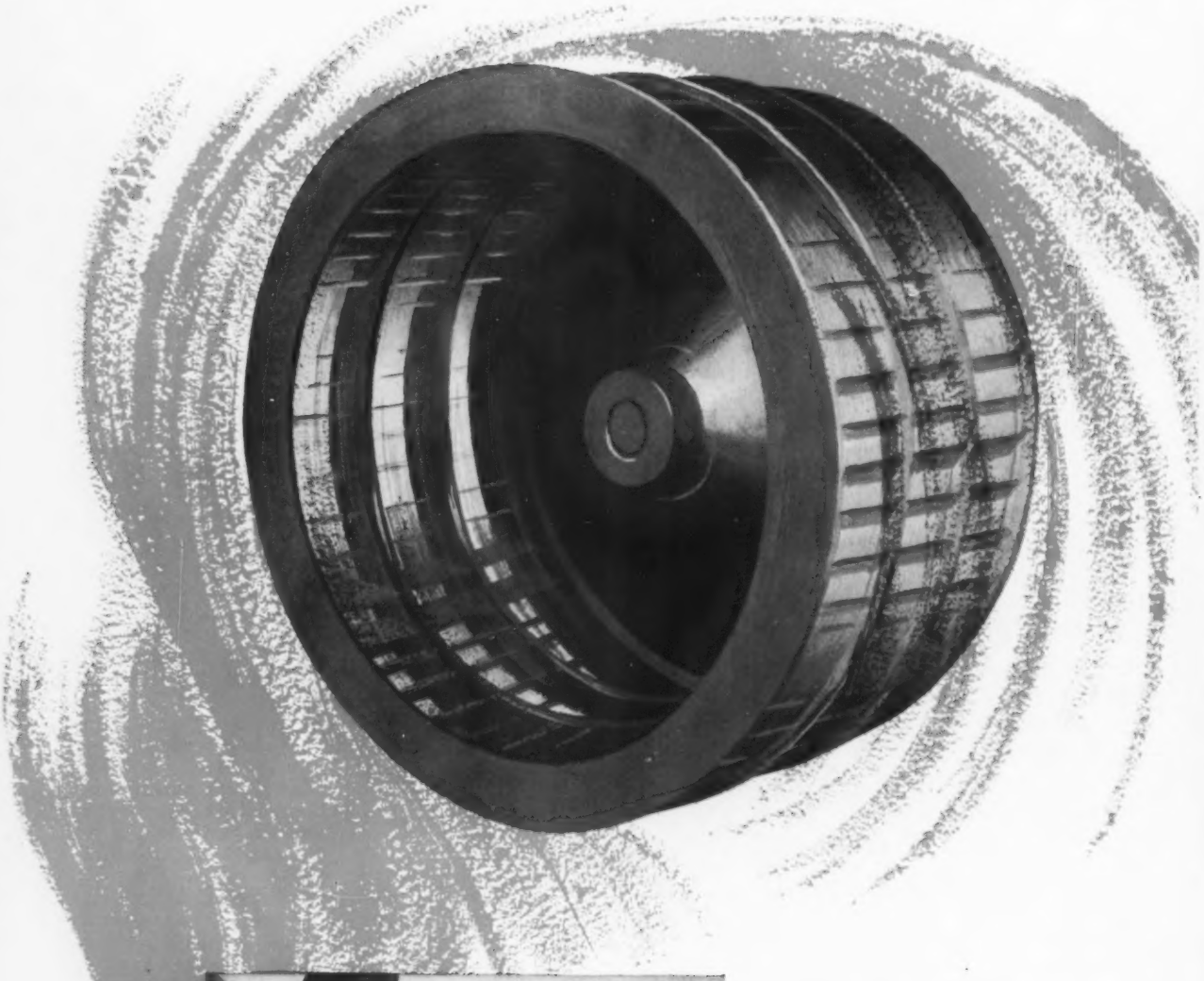
Hand and Power Bending Brakes
Special Metal-Forming Machines

DREIS & KRUMP
MANUFACTURING CO.
7430 South Loomis Boulevard
Chicago 36, Illinois

8816

HEAT • WEAR • CORROSION

HAYNES Alloys solve the

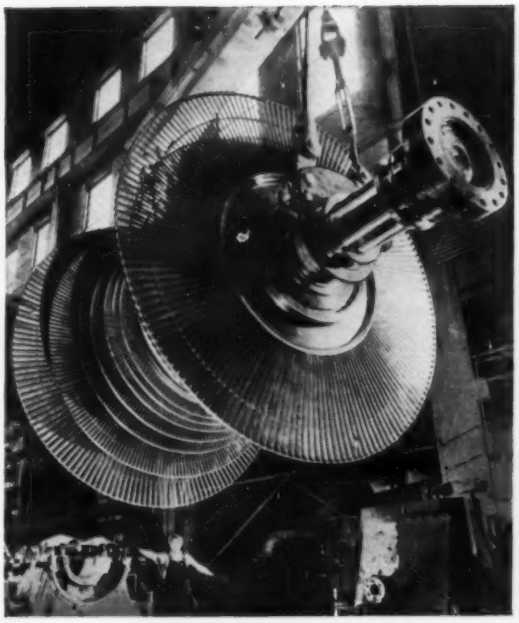


HEAT

10 Years' Service at 1600 to 1800 deg. F.

Rotors and impellers made of MULTIMET alloy are being used to circulate the atmosphere inside heat-treating furnaces where temperatures range from 1600 to 1800 deg. F. They are expected to last 10 years even though they are exposed to both reducing and oxidizing conditions.

tough problems



EROSION

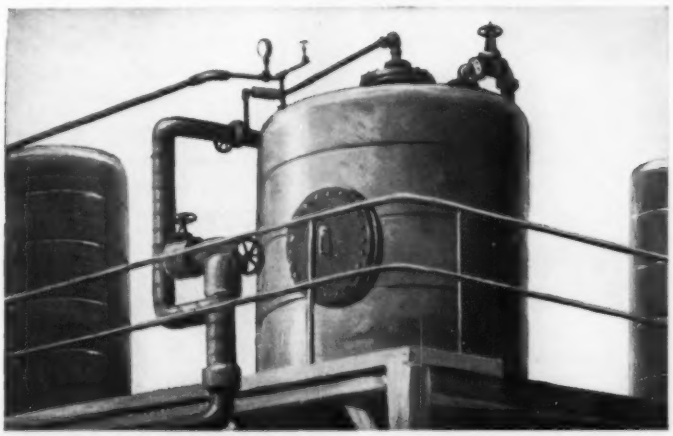
Withstands High Velocity Erosion for 19 Years

Blading at the cold end of steam turbines spins at speeds approaching that of a high speed bullet. At these high velocities even small water particles can cause rapid wear on most metal parts. Yet when the leading edges of these blades are protected by a 27-in. strip of HAYNES STELLITE alloy, they remain in operation up to 19 years!

HAYNES alloys give long, dependable service under some of industry's toughest conditions. They operate for long periods of time at temperatures up to 2000 deg. F; they resist the severe corrosive action of many chemicals; and they withstand the wearing effects of abrasion and erosion.

There are over 100 HAYNES alloys—a wide selection that practically guarantees you a tailor-made solution to your heat, abrasion, or corrosion problems. Many of these alloys are available as sheet, plate, bar stock, tubing, wire, sand castings, investment castings, welding rods, hard-facing rods, and metal-cutting tools.

For complete details on properties, prices, and forms, write for literature, or contact our nearest sales office... HAYNES STELLITE COMPANY, Division of Union Carbide Corporation, Kokomo, Indiana. Sales Offices in Chicago, Cleveland, Detroit, Houston, Los Angeles, New York, and San Francisco.



CORROSION

Resists Chlorine Compounds at 300 deg. F.

Vessels lined with HASTELLOY alloy C last from 2 to 4 years while handling such severely corrosive media as hydrochloric acid, tri-chlor benzene and other chlorine compounds. Because of the unusual resistance of HASTELLOY alloy C to a variety of corrosives, it is widely used in the Petroleum, Chemical Processing, Metalworking, and many other industries.

HAYNES ALLOYS

HAYNES STELLITE COMPANY

Division of Union Carbide Corporation

Kokomo, Indiana

UNION CARBIDE

"Multimet," "Hastelloy," "Haynes," and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

OLSEN has the Dependable, LOW COST LC TESTING MACHINE

. . . for standard tension, compression and transverse tests on metal (strip, spot weld, wire, etc.) plus plywood, bricks, cement, briquettes, textiles, rivets, insulating materials, plastics and many others.

DUAL CAPACITIES 10,000 and 1,000 lb. testing ranges.

ACCURACY to within ± 1% of the indicated load or ± 1 dial division, whichever is the greater.

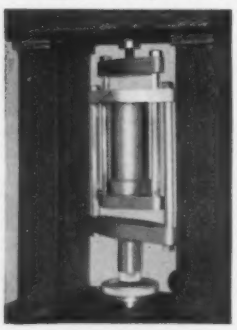
PENDULEVER WEIGHING SYSTEM—pendulum and lever—completely independent of the loading system.

MOTOR DRIVEN OR HAND OPERATED—either model gives assurance of dependable testing service with a minimum capital investment.

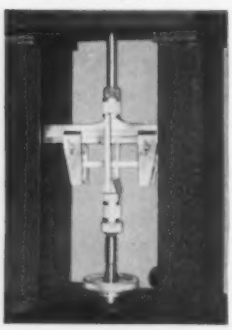
CONVENIENCE—Tools for all types of testing can be inserted quickly and easily, and all controls are readily accessible.

Write for Bulletin 41 today

Compression Testing with an LC.



Flexure Testing with an LC.



LC testing transite pipe

LC IS IDEAL FOR PRODUCTION TESTING, QUALITY CONTROL OR INSTRUCTION.

The Olsen LC answers the needs of industry and educational institutions for a modern, compact and low cost testing machine which can be used for a wide variety of testing problems.

Trademark Reg. U.S. Pat. Off.

TINIUS OLSEN
TESTING MACHINE COMPANY
2120 EASTON ROAD • WILLOW GROVE, PA.
Testing and Balancing Machines

EXHIBITS, MEETINGS

(Continued from P. 13)

Mar. 15-18, Waldorf-Astoria, New York City. Society headquarters, 271 Madison Ave., New York.

Steel Founders' Society of America—Annual meeting, Mar. 17-18, Drake Hotel, Chicago. Society headquarters, 606 Terminal Tower, Cleveland 13.

National Assn. of Corrosion Engineers—Annual conference and exhibition, Mar. 17-21, Civic Auditorium, San Francisco. Society headquarters, 1061 M&M Bldg., Houston.

International Acetylene Assn. — Annual spring convention, Mar. 19-21, The Bellevue-Stratford Hotel, Philadelphia. Society headquarters, 205 E. 42nd St., New York.

American Hot Dip Galvanizers Assn., Inc.—Annual meeting, Mar. 27-28, Penn Sheraton Hotel, Pittsburgh. Society headquarters, 1806 First National Bank Bldg., Pittsburgh.

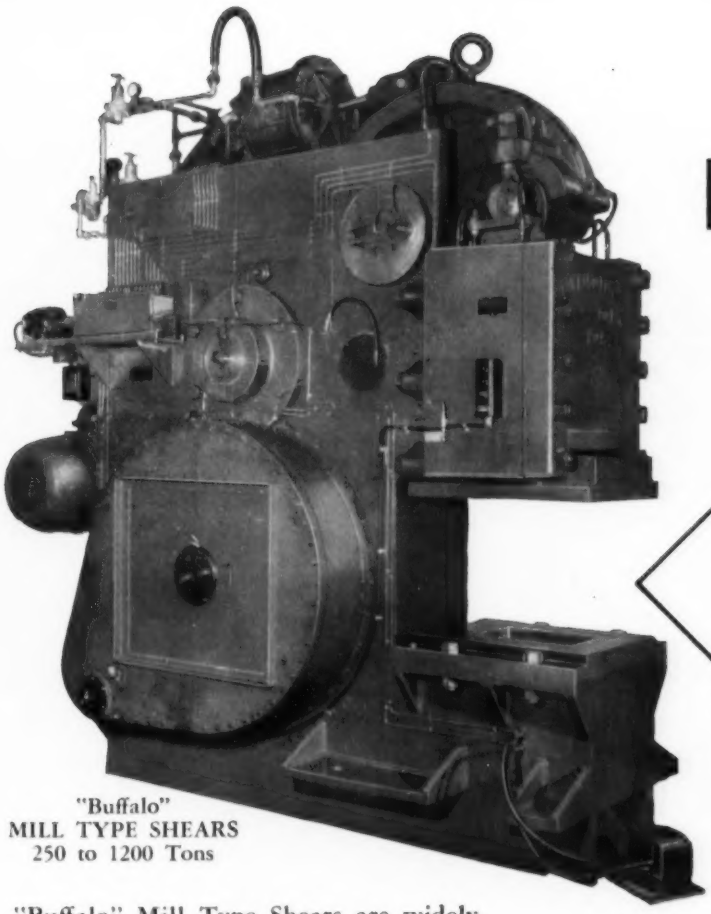
American Society for Metals, The Golden Gate Chapter — Western welding, brazing and heat treating conference, March 27-28, Stanford Research Institute, Menlo Park, Calif. Information: Conference Sec'y—E. R. Babylon, Kaiser Steel Corp., 1924 Broadway, Oakland, Calif.

APRIL

Concrete Reinforcing Steel Institute —Annual meeting, Apr. 6-12, The Boca Raton Hotel, Boca Raton, Fla. Society headquarters, 39 S. Dearborn St., Chicago.

Wire Reinforcement Institute, Inc. —Annual spring meeting, Apr. 7-8, Hotel Boca Raton, Boca Raton, Fla. Society headquarters, National Press Bldg., Washington.

Industrial Fasteners Institute—Annual meeting, Apr. 8-10, Boca Raton Hotel, Boca Raton, Fla. Society headquarters, 1517 Terminal Tower, Cleveland.



"Buffalo"
MILL TYPE SHEARS
250 to 1200 Tons

PLENTY OF POWER

PLUS PLENTY OF TOOLING SPACE

FOR HEAVY DUTY PUNCHING, SHEARING, BLANKING

"Buffalo" Mill Type Shears are widely used throughout industry for performing heavy work falling between that produced by the standard C-type punch or shear and the four-column or straight side press.

Ideal for heavy-duty punching, shearing or blanking, these husky machines offer many unique features not found in standard shearing equipment. For example, the tooling space is not only very generous horizontally — its ample height permits the use of relatively heavy top and bottom bolsters on the plunger face and table.

"Buffalo" Mill Type Shears are available in 12 sizes — from 250 to 1200 tons, depending on the stroke length. For full information, contact your nearby "Buffalo" machine tool dealer, or write for Bulletin 3650.

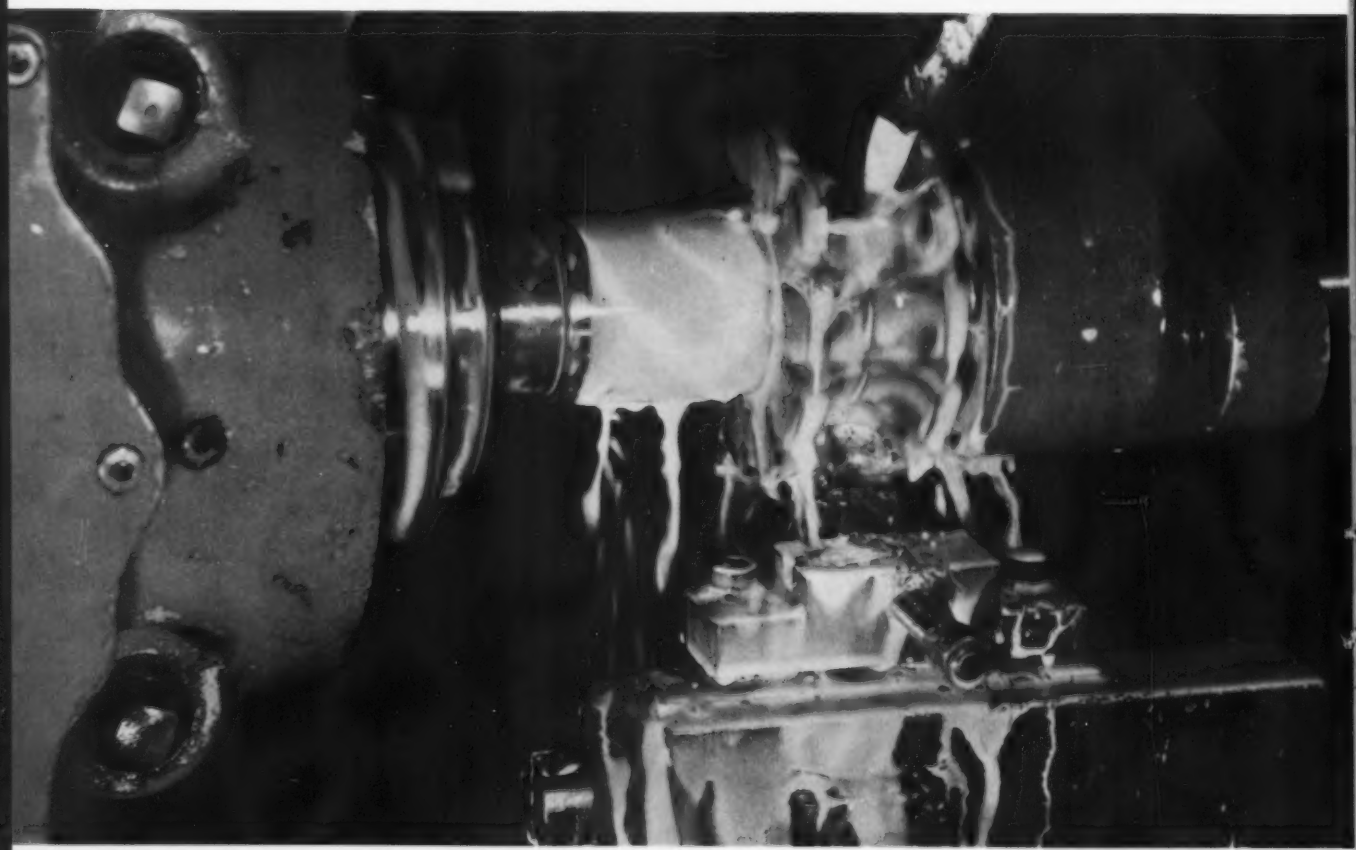
BUFFALO FORGE COMPANY

492 Broadway • Buffalo, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING PUNCHING SHEARING BENDING

Wheels and machines stay cleaner with emulsions of new S.E.C.O. Also, finishes are better.



Emulsions of new S.E.C.O. allow faster cuts with less tool wear.

Photos courtesy of
Peter Salmon Co., Glenside, Pa.

NEW EMULSIFYING OIL KEEPS MACHINES CLEAN, PROTECTS AGAINST RUST, GIVES IMPROVED HARD-WATER EMULSION STABILITY

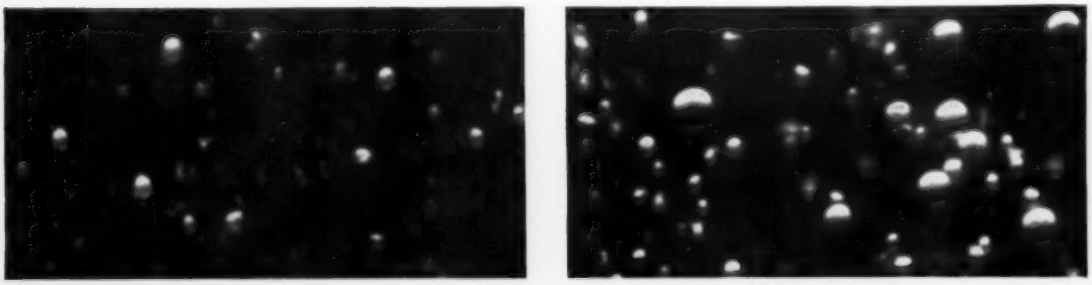
Emulsions of Sun's new S.E.C.O. (Sunoco® Emulsifying Cutting Oil) with smaller oil particle size give you the following benefits—

EMULSION STABILITY—In hard-water areas, impartial field tests show that emulsions of *new* S.E.C.O. stand up better under more severe conditions than those made with other regular emulsifying cutting oils.

DETERGENCY—The excellent wetting properties and detergency of *new* S.E.C.O. allow dirt and fines to settle quickly out of emulsions. Grinding wheels and machines stay cleaner.

RUST-PREVENTION—The smaller oil particle size in emulsions of *new* S.E.C.O. gives better metal wetting properties and increased protection against rust and corrosion. See photos below.

If you're a regular user of S.E.C.O., notice how much it has been improved. If you're not, find out what we mean about greater economy and improved production with *new* Sunoco Emulsifying Cutting Oil. Call your Sun representative, or write to Sun Oil Company, Philadelphia 3, Pa., Dept. I-9.



800x photomicrographs of 10% emulsions. *New* S.E.C.O. emulsion on left contains *8 times* as many oil particles per unit volume as ordinary emulsion on right. Many minute particles in S.E.C.O. emulsion do not show at this magnification.

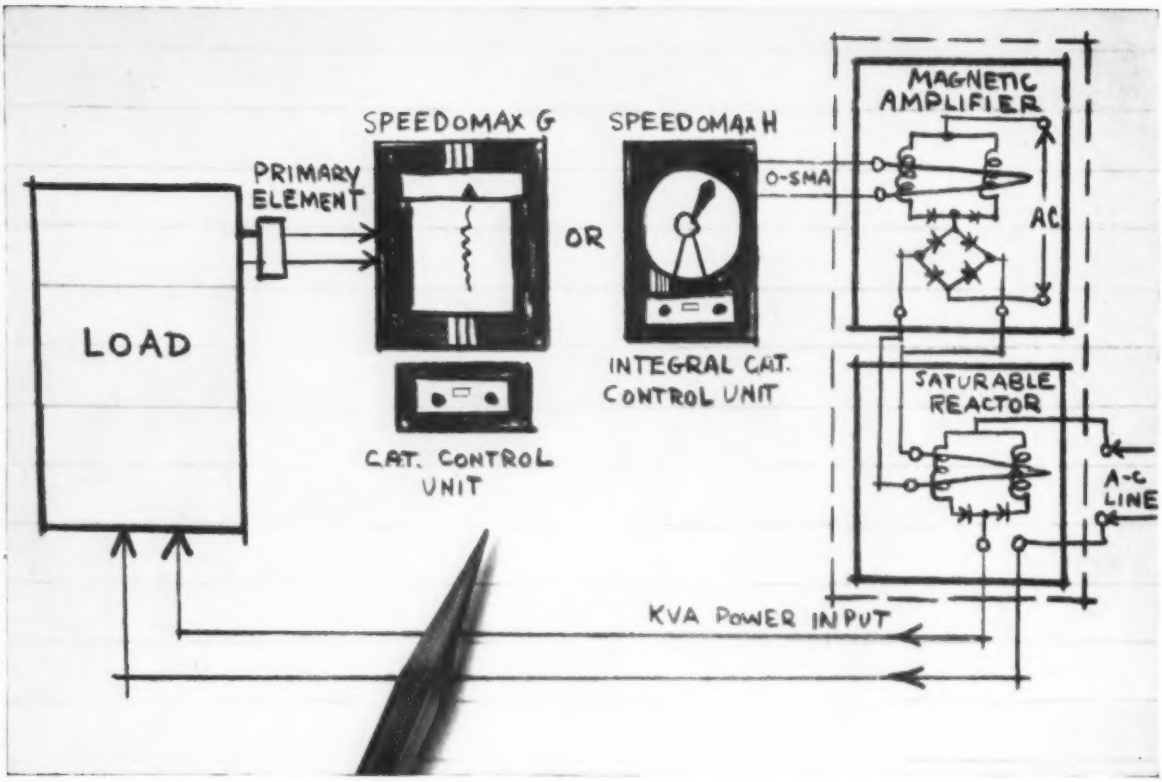
SUNOCO®

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY Philadelphia 3, Pa.

IN CANADA: SUN OIL COMPANY LIMITED, TORONTO AND MONTREAL

©Sun Oil Co., 1958



Now... Stepless control of Electric Heat Input with L&N's new C.A.T. control system

If your process uses electric heating equipment and your product is off-temperature due to cycling of heating elements at high temperatures . . . if excessive downtime and expensive replacement of worn-out contacts cut down production time . . . it'll pay you to learn about L&N's new Current-Adjusting Type control for continuous, efficient power output in saturable core reactor systems.

Already in use on applications like crystal growing and strip annealing, this control permits stepless regulation of power output over the *entire operating range of saturable core reactors.* Its rapid speed of response matches rapid changes in product temperature. The wide range of adjustment of proportional, reset and rate actions facilitates tuning the system to your process, product and production.

C.A.T. control is a complete system consisting of (1) a primary element, (2) Speedomax® recorder, (3) C.A.T. control unit, and (4) a magnetic amplifier and saturable core reactor.

Heart of the system is the C.A.T. control unit. Any temperature change, detected by the primary element and measured by the recorder, is fed to the control unit. Continuous d-c output of the unit over 0 to 5 ma range drives a magnetic amplifier. The d-c output of the magnetic amplifier is fed to the control windings of a saturable core reactor for continuous regulation of power input to the process.

If you're modernizing your present electric process equipment or installing new—make use of our wide experience in providing temperature control systems for thousands of applications. For more information, contact your nearest L&N sales office, or write us at 4956 Stenton Ave., Philadelphia 44, Penna. Ask for Data Sheet ND 46-33(107).

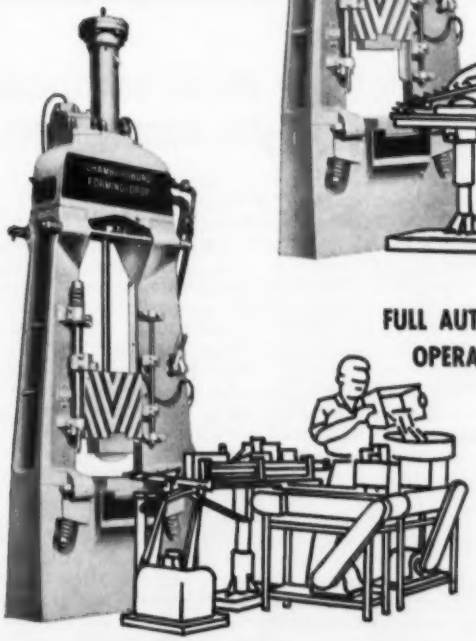
LEEDS Instruments NORTHRUP Automatic Controls • Furnaces

CHAMBERSBURG'S NEW FORMING DROP

AN ELECTRICALLY CONTROLLED GRAVITY DROP HAMMER PERMITTING USE OF AUTOMATIC FEEDING DEVICES–

MANUAL OPERATION

SEMI-AUTOMATIC OPERATION



FULL AUTOMATIC OPERATION

THIS NEW HAMMER, the result of original research and development by the Chambersburg Engineering Company, is especially designed for precision blow control and the accommodation of automatic feeding devices to perform such operations as forming, embossing, coining and re-striking in a single die impression.

Precise blow control is achieved by maintaining close pressure tolerances on the air supply and by the fine adjustment of a regulating valve on the hammer's exhaust system. These two features combined in a Chambersburg-designed hammer structure result in a tool which offers faster, safer, effortless and more accurate production in operations requiring a single blow in a single die impression.

The Forming Drop may be arranged for manual stock handling with a standard treadle operation or mechanical feeds can be engineered and installed to suit a variety of jobs. Utilizing suitable hoppers, sorting and orienting equipment in combination with and synchronized to the hammer, many jobs can be completely mechanized.

Consult with Chambersburg engineers regarding the application of the Forming Drop and automatic feed to your job—or write for Bulletin 73-L-7.

CHAMBERSBURG

THE HAMMER BUILDERS

CHAMBERSBURG ENGINEERING CO.

Builders of THE IMPACTER "FORGING IN MID-AIR"

CHAMBERSBURG, PENNSYLVANIA

THIS IS BILD-A-FLEX!

Republic's new slotted construction angle for all your framing needs

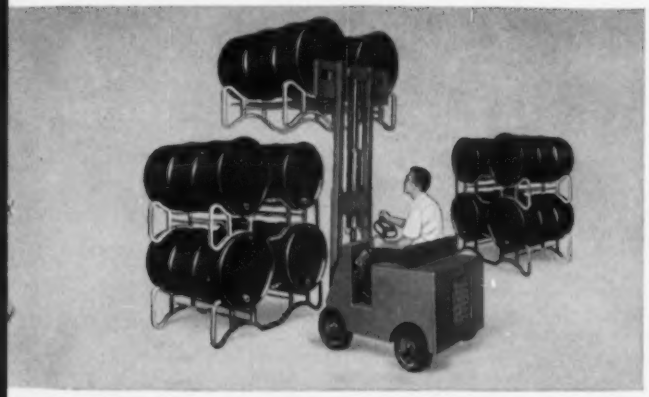
Versatile as a child's toy construction set. Tough for heavy industrial duty. Unlimited in application. That's BILD-A-FLEX, designed and engineered by Republic's Berger Division, industry's most experienced equipment fabricators.

Use BILD-A-FLEX for every framing need. For storage racks, catwalks, supports, guard rails, special purpose tables and stands, scaffolding . . . and hundreds more industrial needs. Use it as "metal lumber." Simply plan your assembly, cut BILD-A-FLEX, join with bolts.

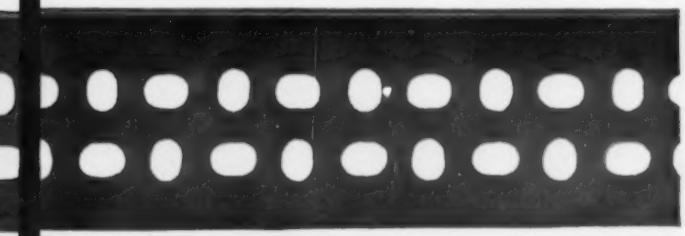
The secret is the precision engineered, unique system of short slots. Placed to allow ¾" Vertical and Horizontal adjustment, they assure utmost flexibility in meeting design requirements. Two-way pattern of short slots provides sufficient bolts in bearing to assure adequate joint strength.

BONUS VALUE! Every BILD-A-FLEX construction angle is Bonderized and finished with baked enamel *after fabrication.* This assures long-time resistance to rust, other damage. It means you can store bundled BILD-A-FLEX angles for use whenever you need framing material. Convenient bundles of 10 angles, in .080 gage or .104 gage, 10- or 12-foot lengths, hardware included. Store in the same space as one 2" x 4" piece of lumber.

BILD-A-FLEX structures are strong, durable and economical. Keep several bundles on hand for in-plant utility. There's no waste with BILD-A-FLEX; when the job is done, your BILD-A-FLEX angles are re-useable. Competent Berger representatives will assist you in designing complete layouts and structures. BILD-A-FLEX angles are stocked for your convenience in ten well-located Republic Warehouses. Save yourself time, space and money. Send coupon for idea-packed catalog.



ANOTHER REPUBLIC EXCLUSIVE! NEW PORTABLE DRUM RACK. Now, more in-use drums can be accommodated in less floor space than ever before. These steel cradles each support two loaded 55-gallon drums, permit orderly stacking of pairs of drums to any practical height. Any standard fork-lift truck can pick up, move, and stack as many tiers of drums at one time as capacity permits. Low in cost. See your Republic materials handling equipment dealer, or send coupon.



DESIGNED FOR HEAVY-DUTY SERVICE. Republic's PB-127 Collapsible Box is ideally suited to shipping castings and other heavy items. It can be tiered when loaded or empty, collapsed or set-up. It offers up to 66% saving in storage space. All parts are permanently attached. It's another item in Republic's big line of materials handling equipment that assures long, efficient service at lowest per-year cost. See your dealer, or send coupon.

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SET KNIFE CLEARANCE AT 8% OF METAL THICKNESS

Turning hand crank "A" changes knife clearance "C". This is indicated on gauge "B". There are no bolts to loosen, no parts to move. The adjustment is easily made in 10 seconds.

8% is a good figure to remember when shearing mild steel. By adjusting the clearance between the knives to 8% of the thickness of steel being cut, you will get the best cuts and the knives will stay sharp longer.

Because of the importance of having the right knife clearance for every shearing job, Steelweld Shears were designed to make this adjustment extremely easy. In fact, it can be made in 10 seconds. Consequently, it becomes a natural routine part of a shear operator's job.

You will find this feature invaluable if you shear various thicknesses. It eliminates the need of working with some fixed compromise knife clearance setting with resultant cuts that vary from the ideal more or less as the knife adjustment is off from the correct setting.

Steelweld Shears are the most modern on the market today with more features that make for speed, accuracy and long trouble-free operation. Some of their fine features are not obtainable in any other machine.

Series 8D-12 Steelweld Shear for cutting steel to 12' x ½". A stainless steel plate 7' x ⅜" is shown being cut. Various thickness plates, as well as heavy steel grating, are also cut on this machine, which is in a West Coast plant. Knives on this hard-working shear last 3 to 6 months before they need to be turned to another cutting edge.

Write for free copy of Catalog No. 2011
Gives construction and engineering details

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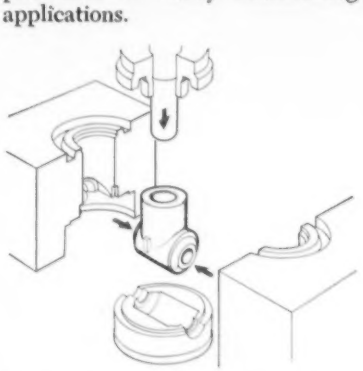
PIVOTED BLADE **SHEARS**

STEELWELD DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. • 4854 E. 282 St • WICKLIFFE, OHIO

CAMERON SPLIT-DIE FORGINGS FOR NUCLEAR POWER PLANTS

The Cameron split-die process has made ferrous forging history in components for extreme service. These AISI Type 304 stainless steel check valve bodies for nuclear power plants are another chapter in the same story. The Cameron processes were perfectly suited to produce these unusual forgings. Even though test requirements exceeded all normal procedure, we were ready to meet the exacting specifications and complete another forging contract. Most important, performance in end use could be predicted and fear of failure eliminated.

Ferrous forgings to 8,000 lbs. produced by this method emerge from our presses in near final form. A vast array of shapes and sizes, heretofore impossible to forge in one piece, are now solving knotty problems in many demanding applications.



Every single production phase from melting the high quality steels for our ingot supply through blooming, forging and heat treating to final machining is performed in our shops under constant control. Men, instruments and machines are teamed to make results predictable. Grain structures in these remarkable forgings are excellent, welds are eliminated, and machining is made easier. The result is a better component which often costs less.

Extending the design scope of ferrous forgings has made Cameron important in solving many problems which confront advanced design today. Extreme service components for airframes, jet engines, guided missiles and a wide variety of other end uses are finding a solution in the Cameron split-die forging process. If you have a problem . . . call, write or come by

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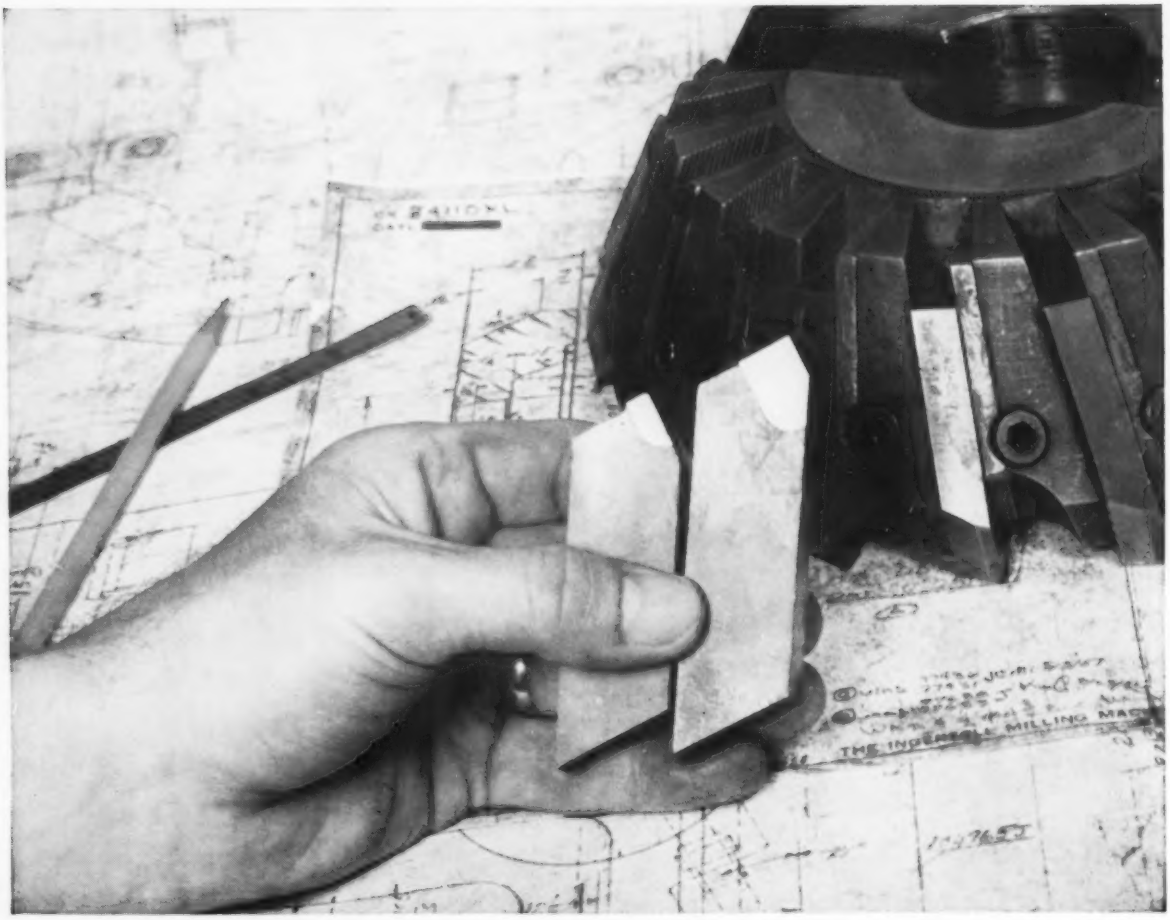


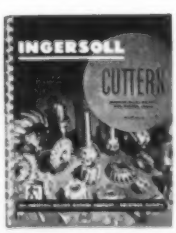
Ingersoll Cone-Type Face Mill for general purpose milling . . . designed for low replacement blade cost.

Do You Get Your Money's Worth?

Most of the carbide in the worn blade was used, but this in itself does not mean that it was used effectively. Many factors are involved in developing the lowest milling cutter cost consistent with improved finishes, faster feed rates and longer tool life.

A continuous review of these factors is part of the day-to-day responsibility of your Ingersoll cutter salesman and of the staff of milling experts he represents. This part of our product has proved its value to hundreds of concerns.

We will welcome an opportunity to tell you more about this service. Write:



If you do not have a copy of this book, write us and we will send you one. It describes in detail the complete line of Ingersoll inserted blade milling and boring tools. Ask for Catalog #66N

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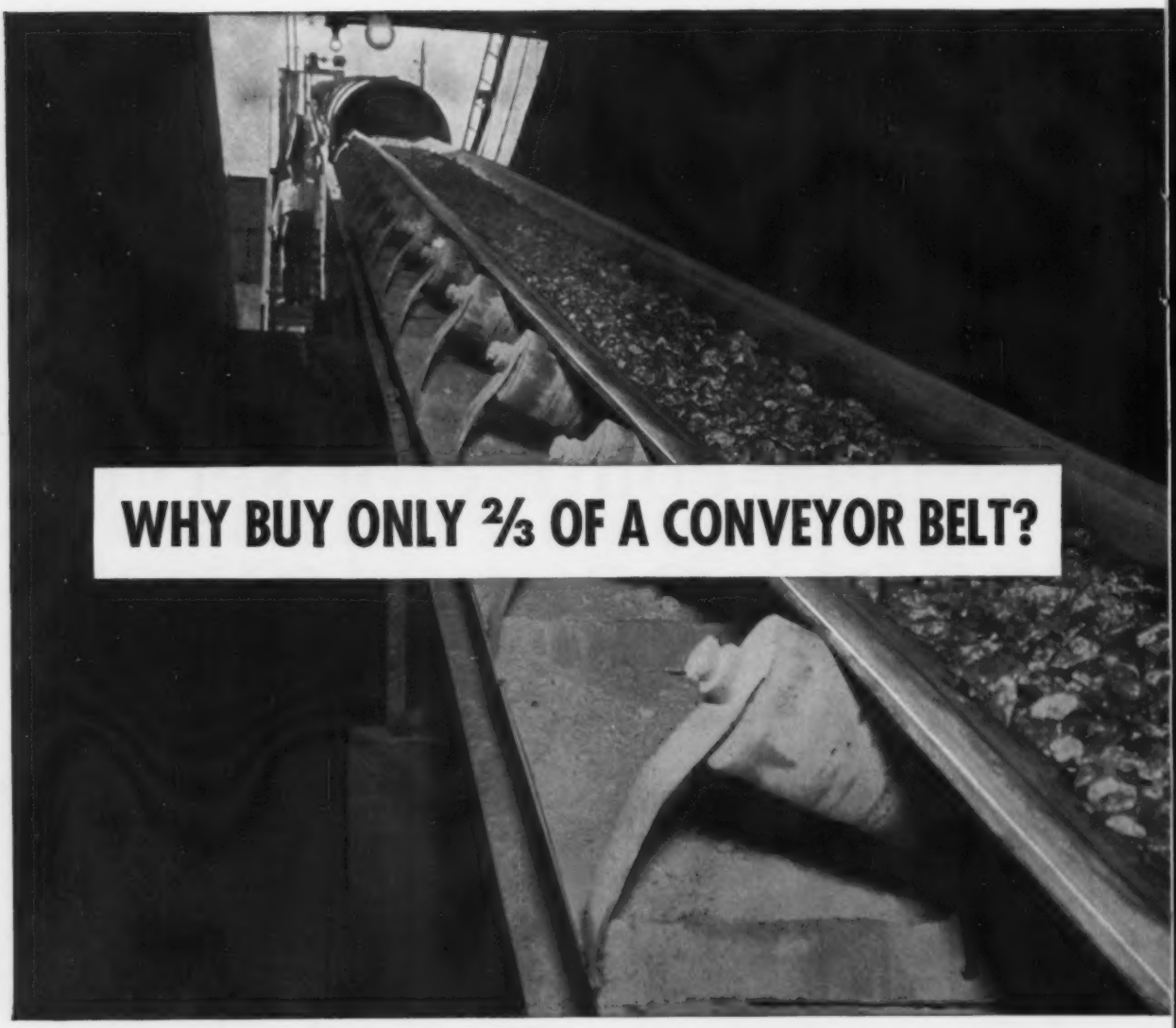

It's the Last Third of an R/M Conveyor Belt that Gives

. . . "More Use ~~per~~ for Your Dollar"

R/M engineers recognize that *every* belt feature — troughability, resiliency, fastener-holding ability, strength member fabric, cover toughness and thickness — all help to determine the true cost of conveyor belt on your job. That's why each component part of Ray-Man Conveyor Belt is precision proportioned to assure better belt balance where it pays off most for you — in *longer* — ⅓ longer — belt service life! These features make the difference!

- Trains Naturally — Handles Fuller Loads
- Resists Impact and Ripping — Takes Abusive Loads
- Double Compensation — Relieves Outer Ply Stress — Flexible
- Holds Fasteners — Requires No Breaker Ply
- Exclusive "XDC" Cover—Protects against Wear, Tear, Cuts and Abrasion
- Moisture and Mildew Resistant

Extra cushioned Homocord and rugged R/M Tension-Master also give you longer belt service life. Write for Catalog 25 CB.

R/M POLY-V® DRIVE— New, patented heavy duty Poly-V* Drive delivers up to 50% more power in the same space as multiple V-drive . . . or equal power in as little as ⅔ the space. Single unit belt design eliminates multiple V-belt "length matching" problems. More constant speed ratios, less wear on belt and sheaves, smoother running. Write for Bulletin #6638.

HOMOFLEX HOSE— Light, strong, "flexible as a rope" . . . easiest handling hose made for air, water, other fluids and gases. Mandrel-made *without* pre-set twist. Resists kinking, coils and uncoils freely in *any* direction. Homogeneous tube-to-cover bond; never any separation. Uniform inside and outside diameters for easy coupling. Write for Bulletin #6879.

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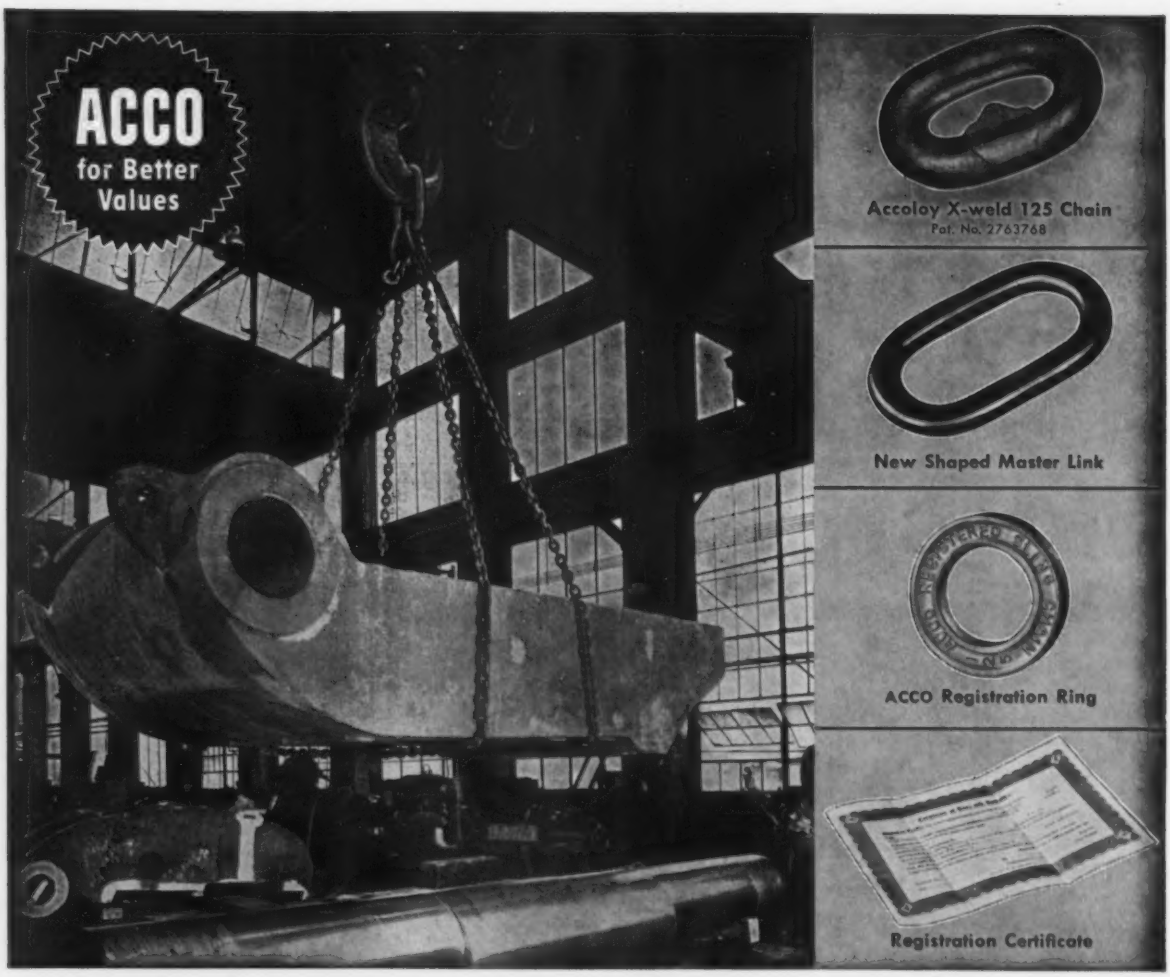

Big, costly loads are safe with Acco Registered® Sling Chains

• Pictured above is a huge, 35,000-pound casting being lifted *easily and safely* by a 4-leg ACCO *Registered* Sling Chain. Directly beneath the load is a highly polished and machined crank shaft worth many thousands of dollars.

Imagine the cost in lost labor and materials, should the sling chain fail! But it won't fail—for this ACCO *Registered* Sling Chain and all its components have the inbuilt strength needed to handle the job with complete safety!

When you buy an ACCO *Registered* Sling Chain, you get these four exclusive "plus values" which *add materially to the worth, but not to the cost,* of the sling:

1 • **Accoloy X-weld 125 Chain**, for extra strength. This chain hangs straight . . . does not kink . . . has extra resistance to bending.

2 • **New Shaped Master Link**, uniquely shaped to withstand deformation under loads up to 18% greater than a round-section link can do.

3 • **ACCO Registration Ring**, serially numbered as evidence that the assembled sling has been factory proof-tested to twice its working load limit.

4 • **Registration Certificate**, signed by us, attesting to the field-tested design and proof-testing of the complete sling.

Remember, the best sling is one of your most economical material-handling tools. You'll find it good business to consult your ACCO *Registered* Sling Chain Distributor on all your sling needs; his counsel is available without obligation. If you don't know his name, write us at York, Pa.

WHAT "ACCO REGISTERED" MEANS

1. The best material
2. Unit safety factor (on bodies, rings, links, hooks)
3. Proof test of complete sling to twice the working load limit
4. Actual field service test of each design
5. Metal identification ring on each sling
6. Signed Registry Certificate with each sling

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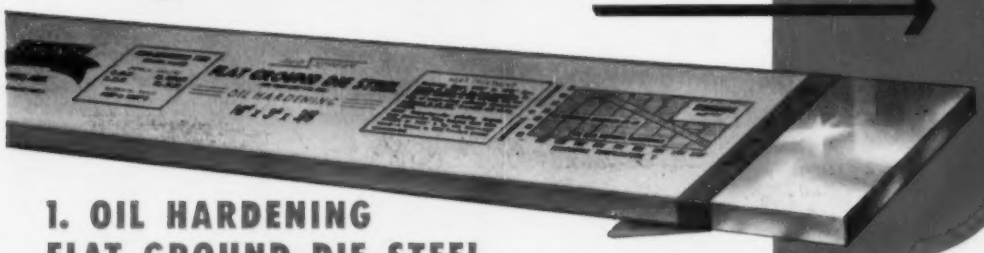

1. OIL HARDENING FLAT GROUND DIE STEEL

Simonds quality-controlled tool steel . . . precision ground . . . ready-to-use . . . comes in 1001 stock sizes for 1001 uses: punches, dies, machine parts, small tools, etc. Spheroidize-annealed for best machinability. Wide hardening range. Oil quench 18" and 36" lengths . . . flats and squares . . . individually packaged. *Chemical Analysis:* C .85-.95, Si .20-.35, Mn 1.30-1.50, Mo .20-.30

2. AIR HARDENING FLAT GROUND DIE STEEL

This 5% chrome, spheroidize-annealed tool steel has exceptional wear-resistant qualities yet is easy to machine and heat treat. Ground to accurate dimensions . . . suitable for a multiplicity of uses . . . individually packaged in a wide range of stock sizes . . . flats and squares . . . standard 36" lengths (18" lengths also furnished, if desired). *Chemical Analysis:* C .95-1.05, Cr 5.00-5.50, Si .30-.50, Mn .50-.70, Mo .90-1.10, V .20-.30

3. and the NEW LOW CARBON FLAT GROUND STEEL

Here's a fine-grained, forging quality, silicon-killed steel that offers important savings on jigs, fixtures, patterns, stripper plates, punch pads, die plates, die-blocking shims . . . and parts that don't require heat treatment, or in some cases just case-hardening. This new line of low-cost steel rounds out the Simonds line of Flat Ground Steel, has equally fine finish, with excellent welding quality and machinability. Furnished in a wide range of flats from 1/16" to 1 1/2" thick and 1/2" to 16" wide, and in squares from 3/8" to 2 1/4". All sizes come in standard, ready-to-use 24" lengths, individually packaged. *Typical Chemical Analysis:* C .18, Mn .50, Si .20, S .04, P .04

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. . . precision instrument gears

new Barber-Colman hobber guaranteed to index accurately within 20 seconds of arc

Barber-Colman engineers have developed a new hobbing machine which guarantees indexing accuracy suited to gears used for aircraft, missile and radar guidance systems. This machine is known as the No. 2½ - 4 hobbing machine and hobs precision spur gears up to 2½" diameter x 4" length, 30 D.P. in steel and 20 D.P. in brass. It provides accuracy, capacity and rigidity for precision fine-pitch work within a nominal price range.

One of the most important features of the new No. 2½ - 4 hobbing machine is the accuracy of relative rotation between the work spindle and the hob spindle which is guaranteed within 20 seconds of arc. This means that the spacing error on the gear caused by the indexing error of the machine would not exceed .00014" on a 2½" diameter gear.

The machine has a capacity for using 3" diameter hobs providing for a greater number of flutes to produce smooth gear tooth profiles. Using proper care in rigid tooling, accurate blanks, mounting of hob and work, and Class AA hobs with accurate sharpening, precision gears to Class 3 tolerances are hobbed with this machine.

Several design features are a departure from standard hobbing machine construction. There is no hob slide — only a hob carriage for conventional feed. In place of a hob slide, the hob arbor is mounted on a swivel which adjusts to compensate for hob thread angle. The work slide is stationary, and the hob swivel raises and lowers to meet diameter requirements. The machine has no overarm support, permitting greater work visibility and operator access. Both work and hob spindles are mounted in precision anti-friction bearings to provide accurate rotation at high speeds. The hob carriage also has anti-friction way supports, and the metal-to-metal contact afforded provides more rigidity than obtained with gib-type mounting. An infinite number of hob speeds are provided without change gears in the range of 200 to 1200 r.p.m.

Rigidly constructed, with a steel weldment base and heavy grey iron machine bed, the machine is designed with a minimum number of parts at points where deflection and inaccuracies may occur. Net machine weight without tooling is approximately 1500 lbs. Standard equipment includes motor and controls and one set of change gears.

For complete specifications and data contact your nearest Barber-Colman representative, or write directly to the factory for a copy of new bulletin F-8642. Orders are now being booked for July and August deliveries.

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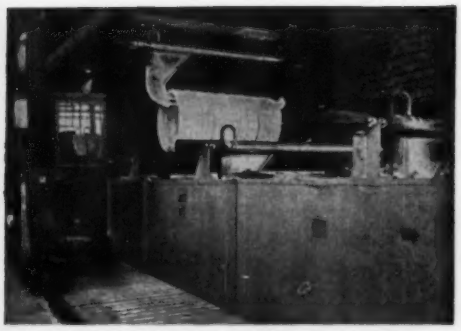
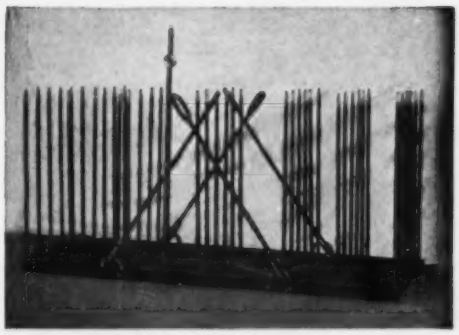
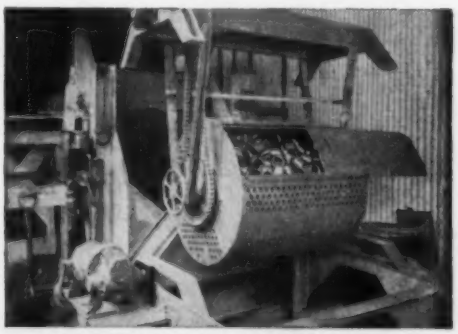
Weldco offers a complete, well-designed line of pickling equipment . . . plus the services of our experienced staff. Let Weldco engineers take care of all your pickling needs. For any problem, large or small, they have the practical, cost-cutting answer.



Weldco Pickling Hooks



Weldco Sheet Pickling Crate



Weldco Mechanical Drum Pickler

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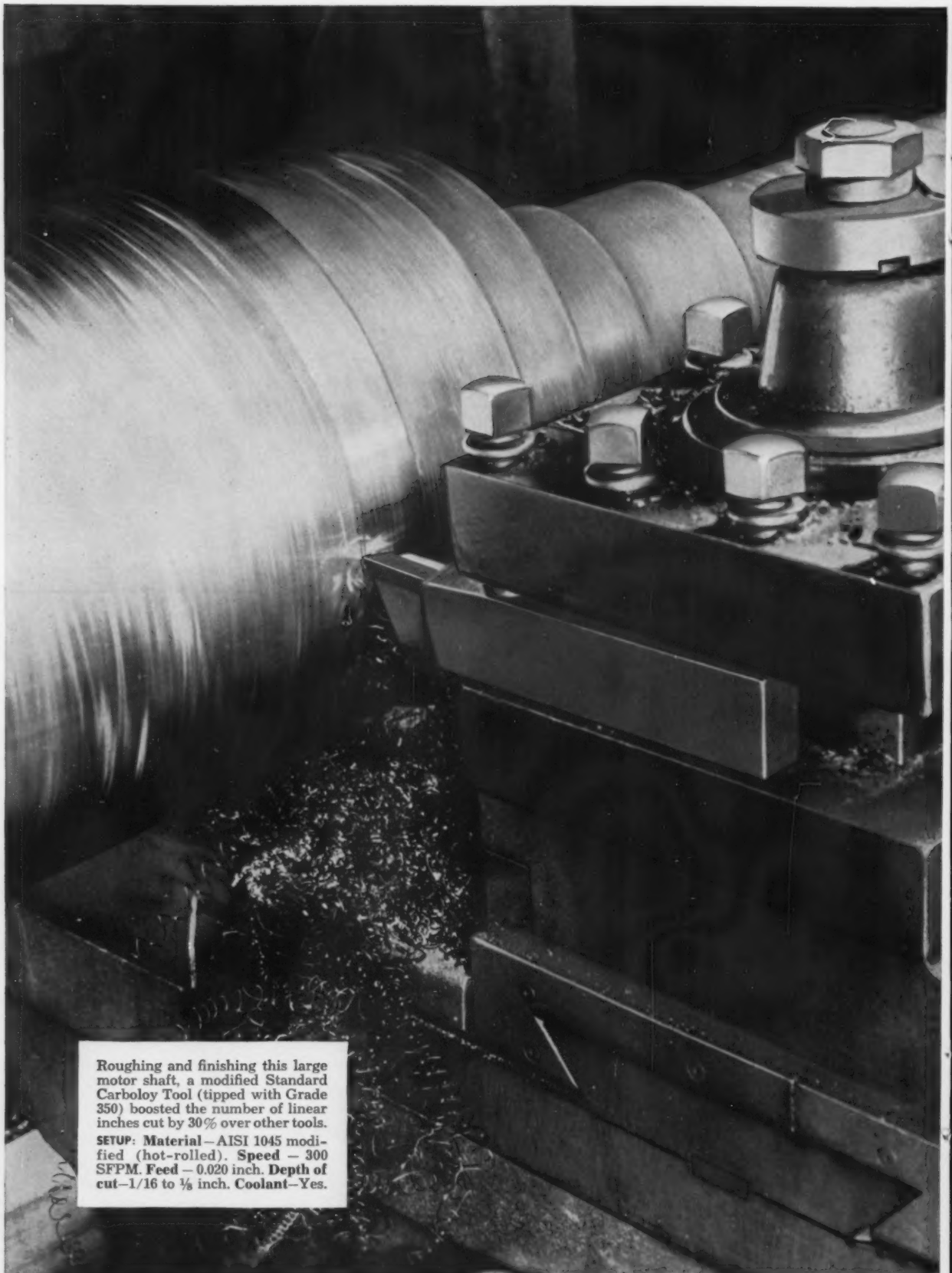

Roughing and finishing this large motor shaft, a modified Standard Carboloy Tool (tipped with Grade 350) boosted the number of linear inches cut by 30% over other tools.

SETUP: Material—AISI 1045 modified (hot-rolled). **Speed** — 300 SFPM. **Feed** — 0.020 inch. **Depth of cut**—1/16 to ⅛ inch. **Coolant**—Yes.

3 reasons why industry specifies more Carboloy® braze-type tools than any other brand

1 Consistent, record-breaking performance

Tough jobs, like the one at left, are the real test of a tool's performance. And in plant after plant, Standard Carboloy Tools have proved that they deliver maximum production – at lowest cost per piece. They're made by the company that pioneered "standards." Their shanks are of the finest cold-drawn steel. Their carbide edges are automatically diamond-ground for accurate machining.

2 Complete range of styles, sizes, grades

Standard Carboloy Tools are available in thirteen styles, hundreds of sizes. Used "as is" or adapted to specials, they can handle up to 80% of all single-point jobs – from rough turning to precision threading. They're available with tips of Carboloy Extra-Performance steel-cutting grades 330, 350, and 370. Or, with carbides for cast irons, super alloys, nonferrous and nonmetallic materials.

3 Immediate delivery from local stocks

There's no waiting for "long distance" delivery when you order Standard Carboloy Tools. Authorized Distributors of Carboloy cemented carbides in 140 cities keep full stocks on hand for off-the-shelf delivery. Your local Carboloy Distributor is listed in your Yellow Pages. Call him today. Or write: *Metallurgical Products Department of General Electric Company, 11153 E. 8 Mile Road, Detroit 32, Michigan.*

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the man who needs a new machine tool is already paying for it

Out-of-this-World Accuracy

Whether they're destined to go "out of this world" or not, many jobs demand some "out of this world" machining. Here's one, on a J & L lathe which is adapted for two-way tracing from the hexagon turret. Critical dimensions on both internal and external tapers, plus several intricate contours are finish-machined in one chucking.

A three-way indexing template holder is push-button controlled. Thus, down-time for template changes is eliminated, and the 180° tracer continues to machine on both the forward and return feed of the saddle carriage.

A single selector switch disengages the tracing unit and the machine is ready for normal* turret lathe operations.

*("Normal" for J & L turret lathes means unsurpassed accuracy, high production, and low, low maintenance.) For details, write for our descriptive folder No. 5425 Jones & Lamson Machine Company, 511 Clinton St., Springfield, Vermont.

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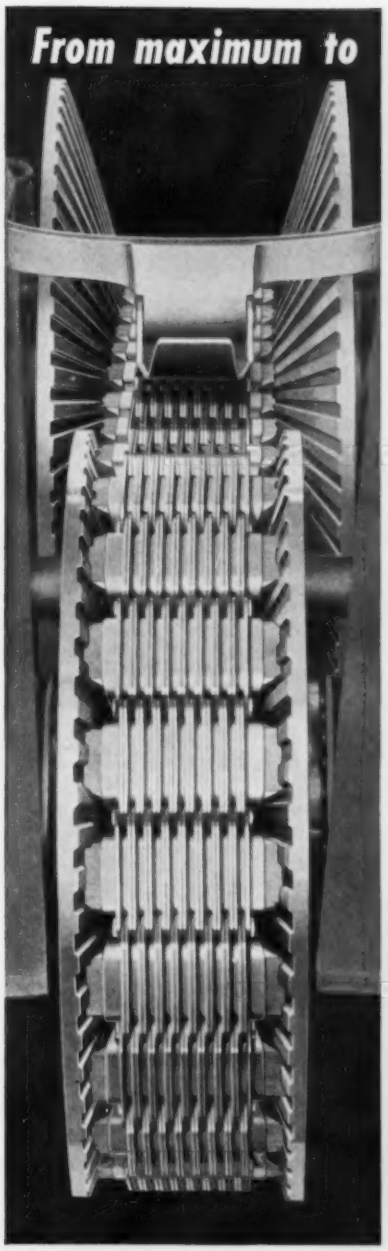
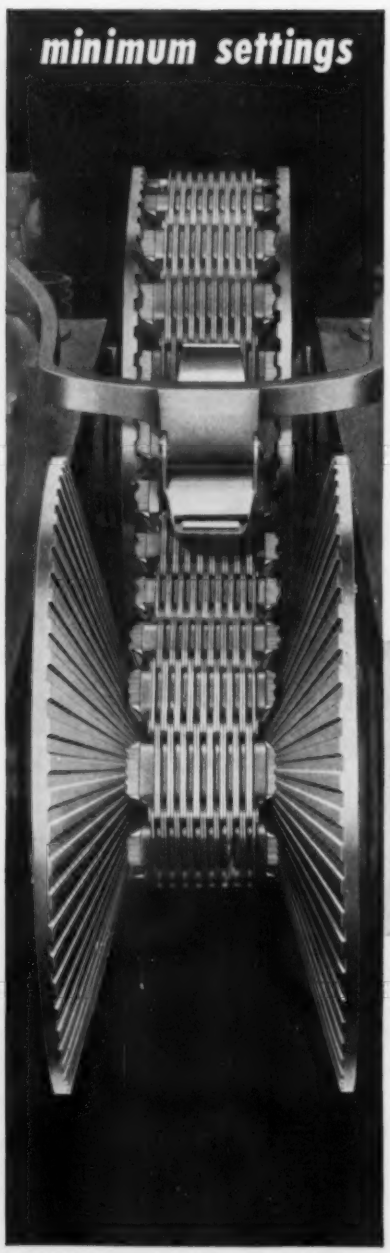
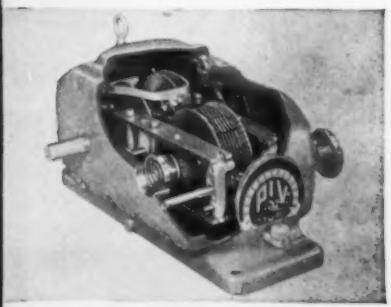




VARIABLE from top speed to minimum speed with no steps, no stops in between. That's Link-Belt P.I.V.—the *only* chain-driven variable speed drive. Teeth—not tension—permit instant ratio changes with no loss of speed, regardless of load conditions.

Slippage? Not a chance—P.I.V.'s chain-to-wheel grip is positive as a gear. In fact, this is industry's most accurate, most reliable mechanical variable speed drive.

Your Link-Belt office or authorized stock-carrying distributor has Book 2274 on P.I.V. drives from ½ to 25 hp. Refer to the yellow pages of your local phone directory under Power Transmission Equipment.



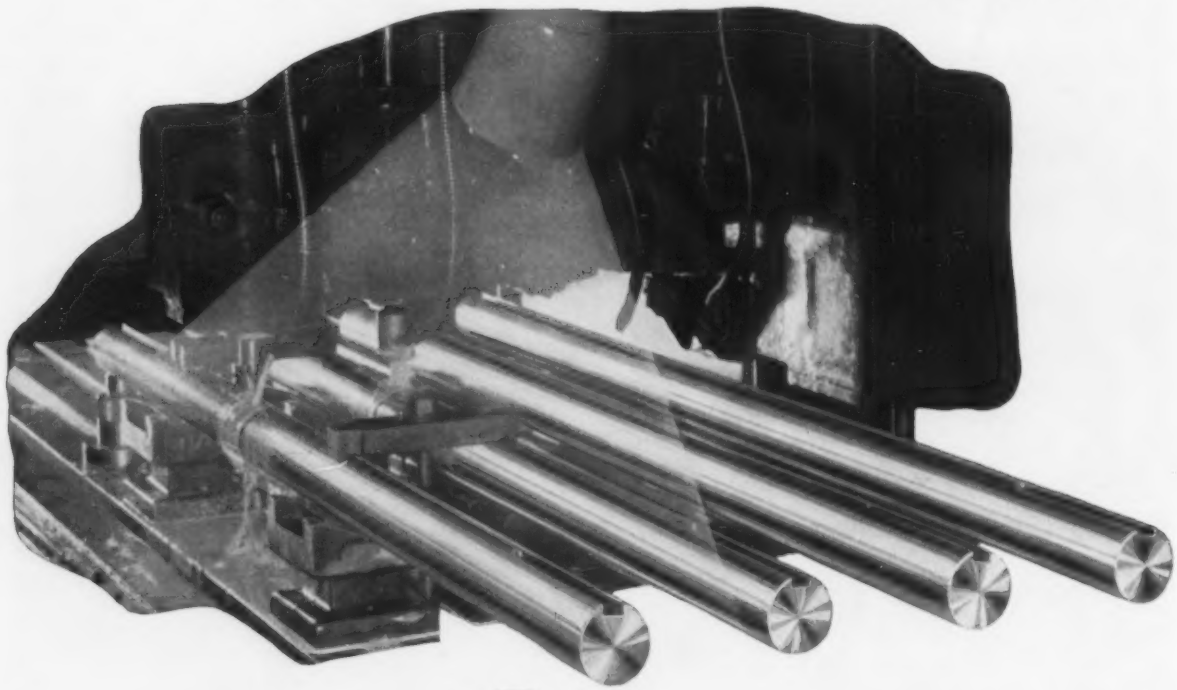
HOW P.I.V. WORKS. Exclusive self-tooth-forming chain of P.I.V. consists of packs of free-sliding steel slats which serve as teeth. Chain grips beveled grooves on pairs of conical wheels located on input and output shafts. Speeds are changed by varying the effective diameters of the wheels, as shown at left.

P.I.V. LINK-BELT
VARIABLE SPEED DRIVE

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14.913

IF YOUR FABRICATING JOB CALLS FOR

COLD DRAWN BARS



...then specify B LUSTERIZED® FINISH

. . . and get the extra values that go with this fine material:

IT'S BRIGHTER
Today's finest *cold drawn finish* now available in a full line of rounds, squares, hexagons, flats

IT'S CLEANER
Easier handling for men or machines with less sludging, soiling or messy clean-ups

IT'S SMOOTH
Suitable for many uses where original cold drawn surface is utilized in machined part

IT'S UNIFORM
An excellent example of B&L quality product with consistent bar-to-bar uniformity

LUSTERIZED
TRADE-MARK REGISTERED
FINISH

DEVELOPED AND PRODUCED
exclusively by
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Black & Decker Tools for maintenance ... electric power at its saving best!

No. 65 VACUUM CLEANER: handles wet or dry material. Big 1¼ hp motor for plenty of suction. Super-flexible hose stretches to a full 15 ft.

6" H.D. BENCH GRINDER: Ruggedly built for H.D. grinding, sharpening, wire brushing or buffing. Full ½ hp constant speed motor keeps jobs moving.

No. 10 SCRUGUN®: Driving screws goes faster; handles up to No. 12 screws. Positive or adjustable clutch; center drive, end handle or pistol grip.

1½" HAMMER: 2200 punching blows a minute makes drilling, chipping, breaking or vibrating go faster, easier. Saves maintenance costs!

Specify the POWER-Built line:

71% of buyers say B&D!

Whether it's a grinder or a cleaner; a drill or a power hammer—over 7 out of 10 industrial purchasers prefer Black & Decker! Experience has told them Black & Decker means *quality*; quality they can depend on to give them years of trouble-free service.

If you have an electric tool need—one illustrated here or any other—do as most people do: think *first* of Black & Decker. That's the name that means a tool to *do the job* and do it for years and years to come. Mail coupon for a free demonstration of the tool you need. THE BLACK & DECKER MFG. CO., Dept. 0903, Towson 4, Md. (In Canada: P.O. Box 278, Brockville, Ontario.)

Look Under "Hardware-Electric" in Yellow Pages

Leading Distributors Everywhere Sell

Black & Decker®

Quality Electric Tools . . . Power-Built for top performance

MAIL FOR FREE DEMONSTRATION

THE BLACK & DECKER MFG. CO., Dept. 0903, Towson 4, Md.

Please arrange a demonstration of your ☐ No. 65 Vacuum Cleaner; ☐ 6" Bench Grinder; ☐ No. 10 Scrugun; ☐ 1½" Hammer.

☐ Send me additional information.

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Turn your pressing problem into a *profit operation* with an

C-FRAME STRAIGHTENING PRESS

Accessible, fast, flexible for performing a variety of general-purpose straightening, forcing, bending and forming work. Sizes and capacities for all service needs.

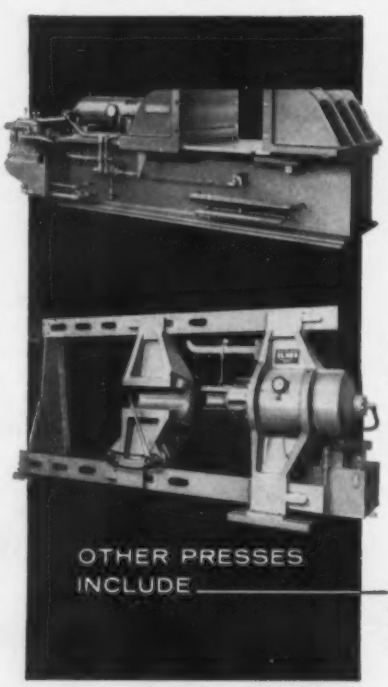
ELMES

"Job-Fitted" HYDRAULIC PRESS

Hundreds of manufacturers have called on Elmes to help solve production problems involving pressure application. It's no secret that Elmes engineering is pre-eminently qualified to provide this profit-making service—to recommend *the right press for the job.*

It will pay *you*, too, to call in Elmes on your pressing problems. Maybe your answer is in one of the many standard Elmes® designs, either "as is" or with simple modification. Or, if your requirements are special, Elmes will develop a "custom-built" press to fit your needs *exactly*. This special-design function has long been an important part of Elmes' service to industry.

In any case, you'll be wise to take advantage of engineering knowledge, skill, and foresight backed by more than 60 years of leadership in specialized hydraulic service. Recommendations and cost estimates promptly supplied. See your Elmes Distributor, or write us direct.



HORIZONTAL BULLDOZER

For heavy bending and forming. Wide range of capacities with optional choice of bed size, stroke and speed to suit individual needs.

INCLINED FORCING PRESS

For forcing heavy wheels, gears, and pulleys on and off shafts, for maintenance work, etc. Capacities from 100 to 1000 tons.

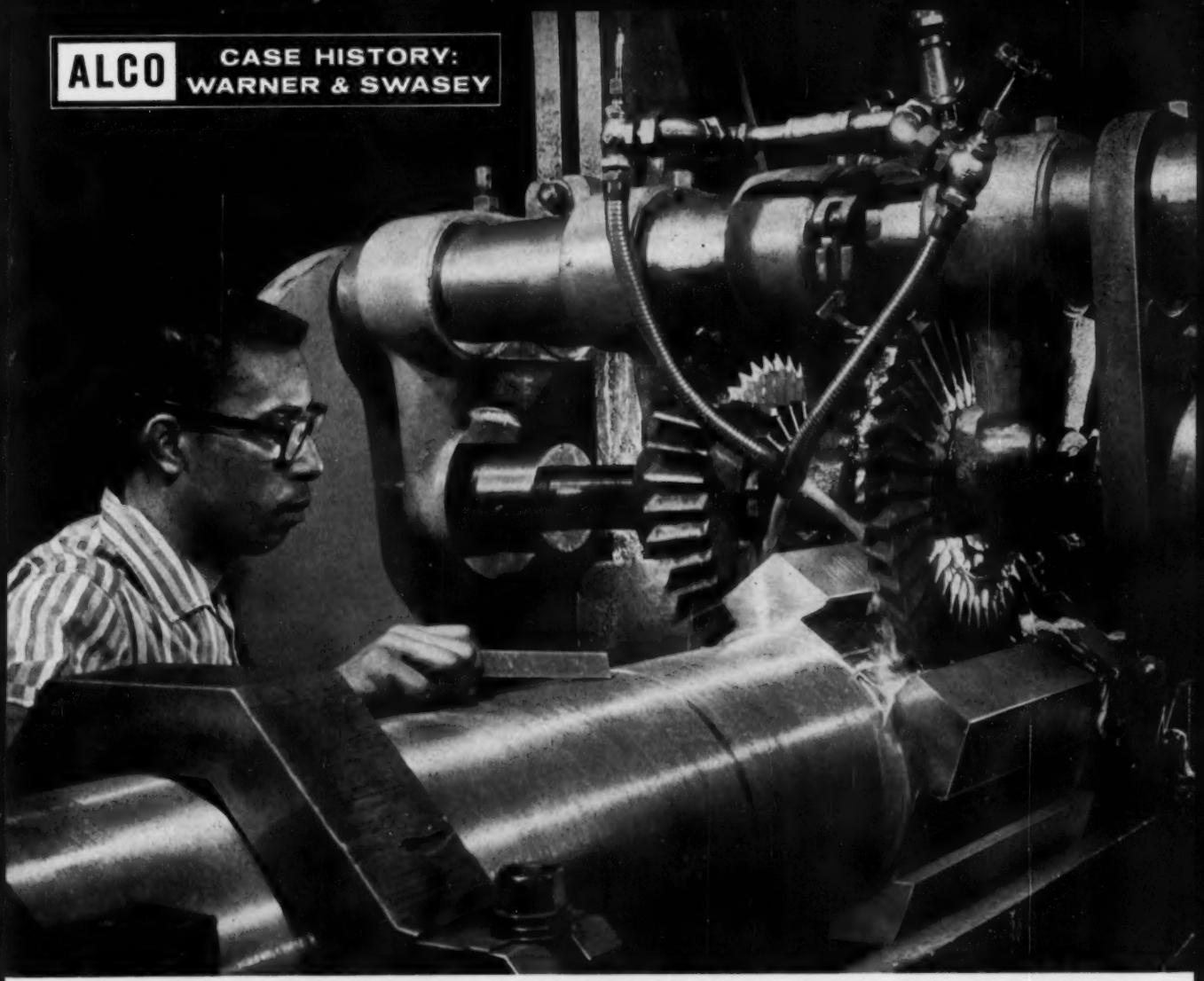
standard and special designs for drawing and forming, coining, forging, hobbing, powder metal compacting, etc.

Elmes American Steel Foundries
ENGINEERING DIVISION

1166 Tennessee Avenue, Cincinnati 29, Ohio

METAL-WORKING PRESSES • PLASTICS MOLDING PRESSES • PUMPS • ACCUMULATORS

ALCO CASE HISTORY: WARNER & SWASEY



With ALCO's *Hi-Qua-Led Steel forgings, Warner & Swasey reduced time for straddle-mill dovetailing of tool holder's pentagon shape by 71%.*

MACHINE TIME CUT 33%, TOOL LIFE TRIPLED WITH ALCO'S HI-QUA-LED® STEEL FORGINGS

With open-die forgings of ALCO's special free-machining Hi-Qua-Led Steel, Warner & Swasey has reduced machining time 33% on a pentagon-bar tool holder for their automatic chucking machine. Time for the various milling operations has been reduced as much as 71%, and turning time 33%.

Warner & Swasey has found that in every operation the use of Hi-Qua-Led forgings has meant savings in tool life, machining time or both. In the trepanning operation, run at the same speed as before, the life of expensive tools has increased up to three times.

ALCO's Hi-Qua-Led Steel forgings have unique advantages of machinability, while maintaining the physical characteristics of regular forgings of the same grade. Cost is just a few cents more. Circular shapes, forged and rolled, range from 18 to 145 in. OD; open-die shapes from 1000 to 30,000 lbs and up to 40 ft long; mandrelled ring forgings up to 60 in. wide.

Contact your nearest ALCO sales office for full information on the many advantages of Hi-Qua-Led Steel forgings, or write ALCO Products, Department 154, Schenectady, New York.

ALCO

ALCO PRODUCTS, INC.

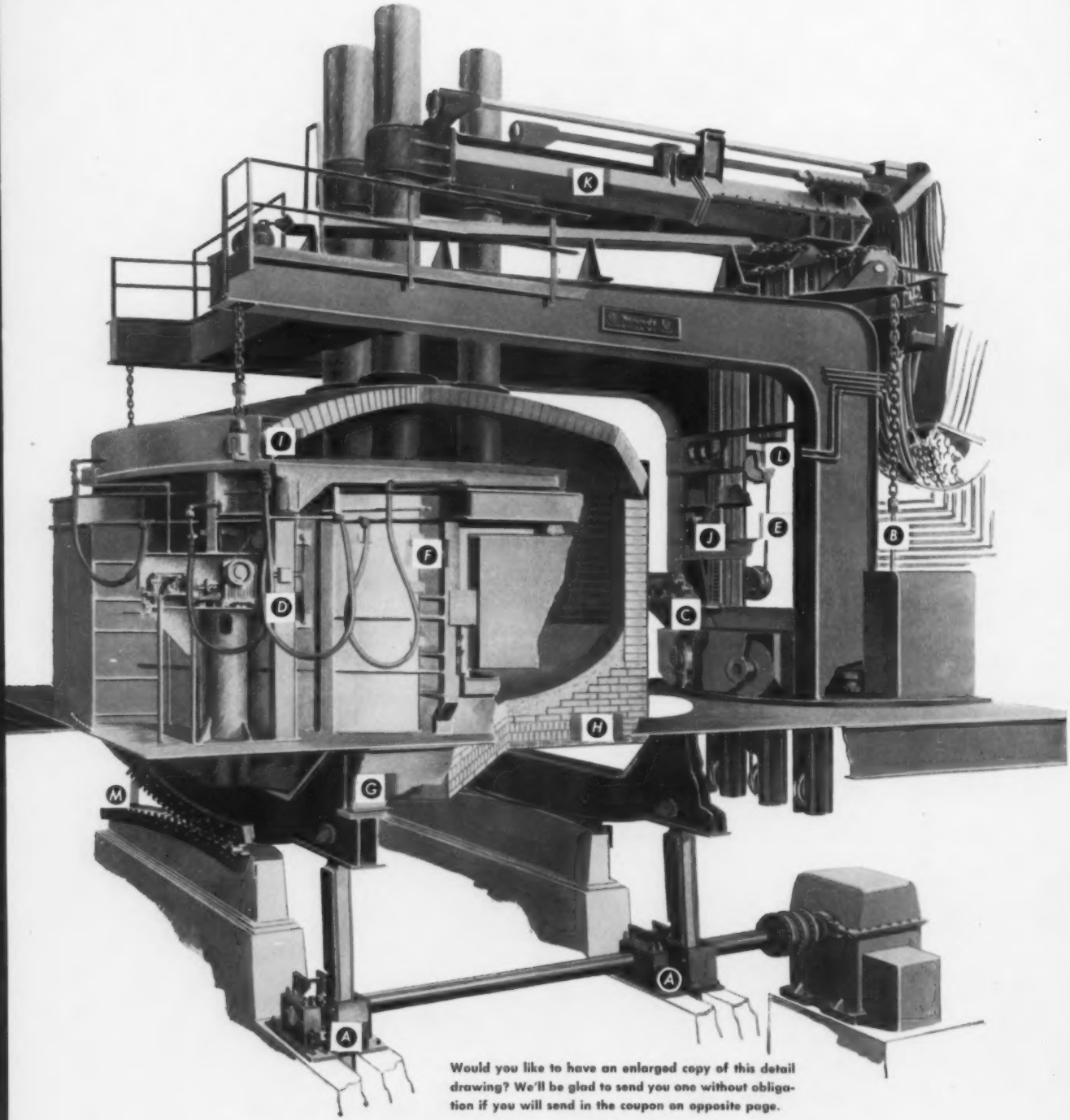
NEW YORK

SALES OFFICES IN PRINCIPAL CITIES

LOCOMOTIVES • DIESEL ENGINES • NUCLEAR REACTORS • SPRINGS • STEEL PIPE • FORGINGS • OIL FIELD EQUIPMENT

Famous Heroult Furnace redesigned . . .

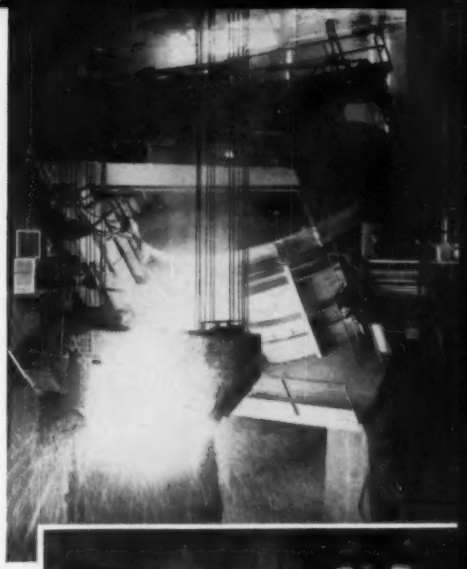
to help you keep down the cost of

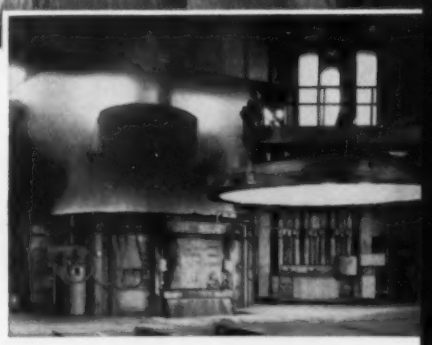


Would you like to have an enlarged copy of this detail drawing? We'll be glad to send you one without obligation if you will send in the coupon on opposite page.

We welcome an opportunity to help you select and install the Heroult Furnace best suited to your requirements. Remember—*the Heroult we make and install for you will be the finest electric melting furnace that money can buy!*

electric furnace steel





To help you produce better quality steel faster and more economically, we have made important design improvements in the long-famous Heroult Electric Melting Furnace. Five of the features shown in the cutaway drawing at the left and described below are to be found *only* in the new Heroult. *All ten* of the illustrated features are important to those interested in the most modern melting equipment. Any way you look at it—performance efficiency, operating economy, or low-cost maintenance—this *new* Heroult is unquestionably the *finest* electric melting furnace on the market.

1. The Heroult Furnace is *the only 100% mechanically operated electric furnace.*

It includes such mechanical features as: (A) heavy rack-and-pinion-type tilting mechanism, (B) mechanical roof lift, (C) motor-driven, rotating, jib-type roof swing, (D) winch-operated, water-cooled, jib-type door-lifting mechanism, and (E) high-speed, electro-mechanical electrode-positioning mechanism.

2. *Another exclusive* — Cage-type shell construction with shell plates loosely attached (F) to a heavy supporting structure.

This construction minimizes shell warping and allows easy replacement of damaged shell plates.

3. *Exclusive* — Operating mechanism independently supported.

The tilting platform on which all operating mechanisms are supported is attached directly to the rockers independent of the shell structure (G). Thus operating mechanisms are unaffected by any shell distortion.

4. *Exclusive*—Flat Bottom Shell.

This feature (H) facilitates easy shell relining and provides maximum protection against burnouts. Thicker refractory at the sides of the hearth promotes more uniform bath temperature.

5. *Exclusive* — Water-cooled, Skew Back Roof Ring.

This feature (I) eliminates the need for special skew-shaped roof refractories.

6. Electrode Mast Safety Device.

This spring-loaded, rack-and-pawl-type device (J) provides positive protection against damage resulting from electrode winch cable breakage.

7. Square-Section, Water-Cooled Electrode Mast Arms.

This design (K) guarantees a rigid connection between mast and mast arm, thus helping to maintain proper electrode position.

8. Remote-Controlled Electrode Clamps.

This device, of the spring-clamp, air-release type, is located inside of the rear section of the water-cooled mast arm where heat cannot affect it.

9. Square-Sectioned Electrode Mast.

This design feature (L), developed by American Bridge, assures proper guiding and electrode positioning.

10. Rockers.

The heavy fabricated steel curved top and bottom rockers (M) minimize forward travel during tilting. These rockers are so designed that the furnace will tend to return to horizontal position from any degree of tilt.

THE NEW

Heroult

ELECTRIC FURNACES

are available in:

—sizes of shell diameter ranging from 7′ 0″ up, and with capacities of from 6,000 lbs. up to 400,000 lbs. and greater. They are equipped with roof-removing mechanism to permit fast top charging. They can readily be furnished with a non-magnetic shell bottom section to accommodate induction-stirring equipment.

Gantry-type top-charge furnaces, door-charge furnaces, and special furnaces for duplexing and non-ferrous melting can also be supplied.

Heroult

ELECTRIC MELTING FURNACES

Send coupon for catalog and/or enlarged copy of detail drawing with special installation and engineering data.

American Bridge Division
525 William Penn Place, Dept. 1A-38
Pittsburgh 30, Pa.

Please send me a copy of the latest Heroult Electric Furnace catalog ( ) and/or your new folder showing large drawing with special installation and engineering data ( ).

Name ..... **Title** .....

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American Bridge
Division of USS United States Steel

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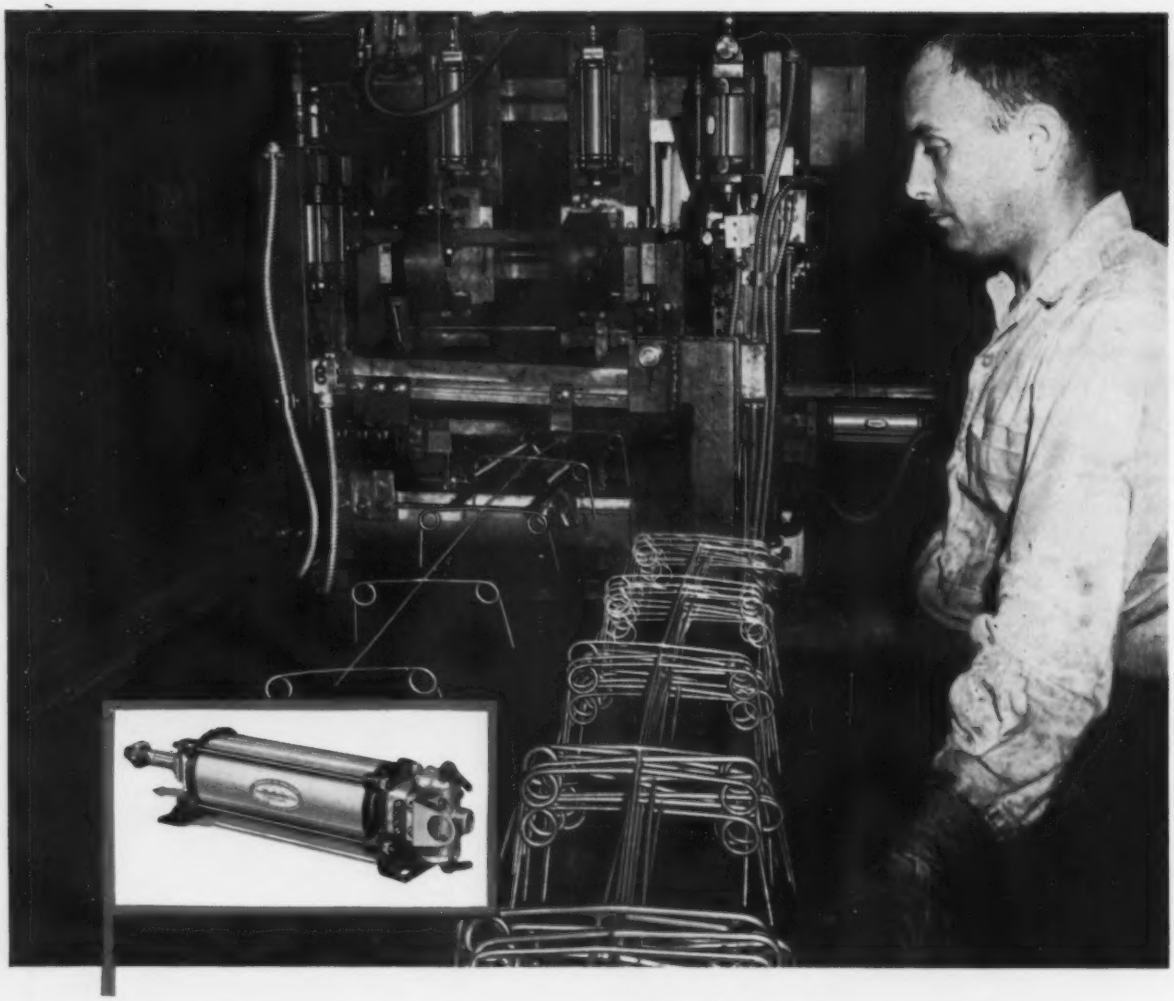


THE BELLOWS AIR MOTOR PUTS PRACTICAL AUTOMATION WITHIN REACH OF EVERY PLANT IN EVERY INDUSTRY

Regardless what you make, The Bellows Air Motor can spark cost-saving ideas in the minds of your methods engineers who are looking for practical ways to put automation to work.

Here's a typical case:

The wire reinforcement shown above is an old product. Many companies had made it by hand without change for over 40 years. But Conver Steel & Wire Co., New York, had an idea.

With Bellows Air Motors as the heart, they designed and built a special machine to cut, move, and form the wire. Bellows Air Motors with a single operator now do the work five men did with their hands.

In your operations, too, there are scores of ways in which these ingenious air cylinder power units can be combined with a little imagination to save money. Packing a lot of "controlled power" in a small space, Bellows Air Motors will perform virtually any pull, push, lift or turn motion quicker, safer and more reliably than it can be done by hand or by cams, gears, levers or other mechanical aids. They put practical cost-saving automation within easy reach of every plant in every industry.

Would you like to see a file of cost cutting ideas other companies have developed using Bellows Air Motors? Write Dept. IA 358, The Bellows Co., Akron 9, Ohio.

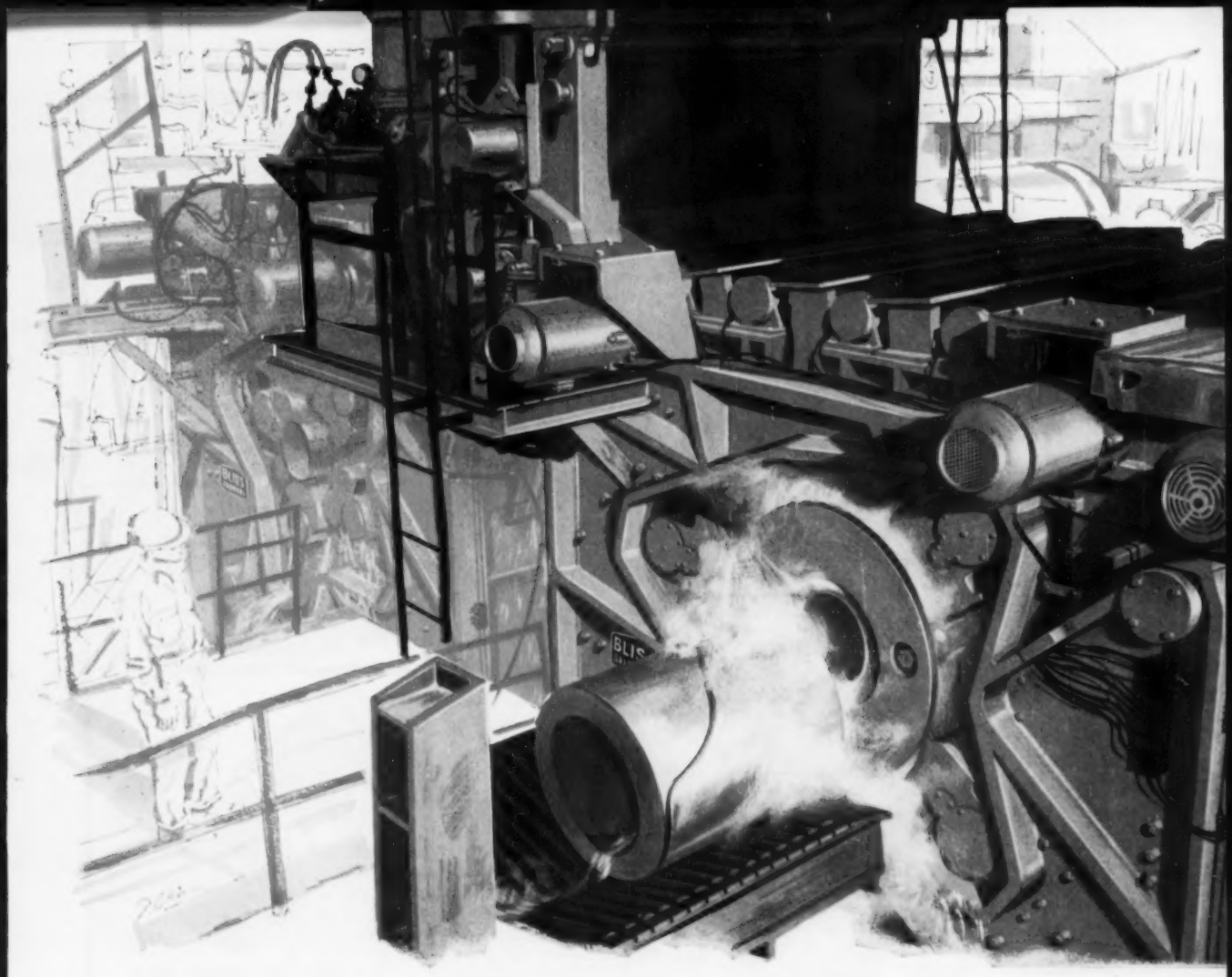
In Canada: Bellows Pneumatic Devices of Canada, Lt., Toronto 18.

The Bellows Co.

DIVISION INTERNATIONAL BASIC ECONOMY CORPORATION

AKRON 9, OHIO

1031-B



J & L finds a thrifty way to equip a mill with new downcoilers

Not long ago, the 96" hot strip mill at Jones & Laughlin's Pittsburgh Works began to show need for coiler improvements. Bliss Rolling Mill engineers were called in to see what could be done.

After analyzing the situation, they determined that parts of the existing coilers could be retained for use with the Bliss Downcoiler principle. Bliss then performed the task of special design and "field tailoring" to insure improved functional operation.

Today, J & L has the equivalent of a pair of brand new downcoilers, complete with new housings, blocker rolls, stripper mechanisms, roller tables, guides and pinch roll units. The new coilers can handle 30,000 pound coils up to 94" wide.

This particular installation is typical of the Bliss Rolling Mill Division's versatility and open-minded approach to a customer's problem. It's easy to learn more about what they have done and can do... just write us today for a free copy of our 84-page Rolling Mill Brochure, Bulletin 40-B.

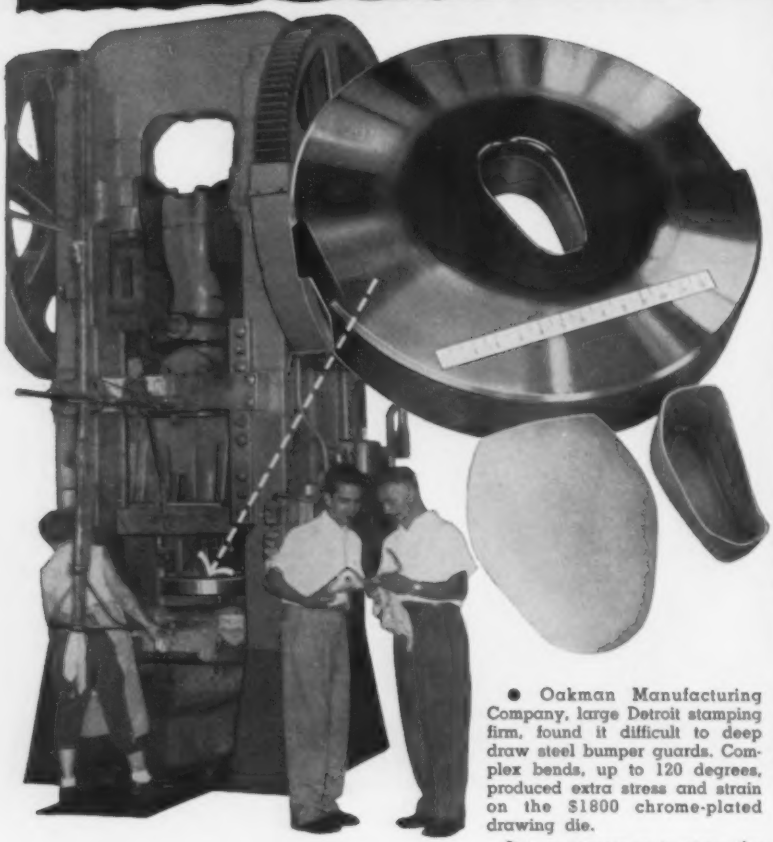
BLISS
SINCE 1857

100 years of making metal work for mankind

E. W. BLISS COMPANY, Rolling Mill Division, Salem, Ohio

Subsidiary: The Matteson Equipment Company, Inc., Poland, Ohio

TALIDE DIE SAVES OVER $20,000 DRAWING AUTO BUMPER GUARDS



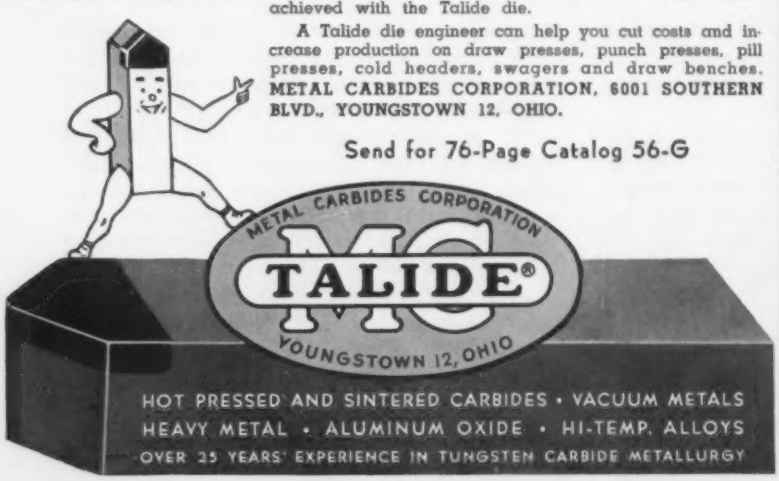
● Oakman Manufacturing Company, large Detroit stamping firm, found it difficult to deep draw steel bumper guards. Complex bends, up to 120 degrees, produced extra stress and strain on the $1800 chrome-plated drawing die.

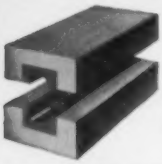
It was necessary to stone the die surface every hour, and hand polish entire drawing surface after each day's run. The steel die had to be completely reworked and a new chrome-plated surface added after drawing 60,000 parts. Downtime for maintenance made it difficult to maintain production schedules. Maintenance costs soared.

A Grade C-80 Talide die ($2700) was installed 8 months ago. To date it has drawn over 800,000 guards with no wear in evidence. Downtime for die maintenance has been greatly reduced. A buffing operation (25c per piece), previously required, has been entirely eliminated because of the smoother, brighter, more durable finish achieved with the Talide die.

A Talide die engineer can help you cut costs and increase production on draw presses, punch presses, pill presses, cold headers, swagers and draw benches. **METAL CARBIDES CORPORATION, 6001 SOUTHERN BLVD., YOUNGSTOWN 12, OHIO.**

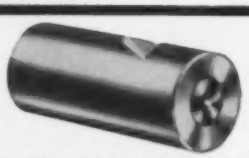
Send for 76-Page Catalog 56-G


METAL CARBIDES CORPORATION
MC
TALIDE®
YOUNGSTOWN 12, OHIO
HOT PRESSED AND SINTERED CARBIDES • VACUUM METALS
HEAVY METAL • ALUMINUM OXIDE • HI-TEMP. ALLOYS
OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY



SWAGING DIES

Leading Fountain Pen Manufacturer cold swages 33 times more stainless steel parts with TALIDE dies.



HEADING AND EXTRUSION DIES

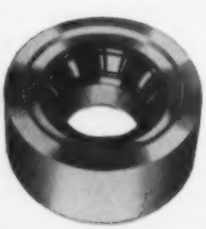
Cold heading ¼" C-1008 rivets, TALIDE dies produced 11,200,000 pieces, other carbide dies only 3,500,000.

CURLING ROLLERS

TALIDE Curling Rolls last 65 times longer than steel rolls on beverage can forming operation.

BLANKING AND FORMING DIES

70 times more paper discs blanked out with TALIDE—over hard alloy die.

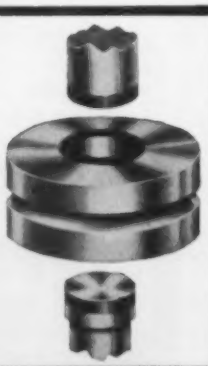


SHEET METAL DIES

137,000 hi-alloy steel pressure vessels drawn with TALIDE against only 7,900 with steel dies previously used.

POWDERED METALLURGY DIES

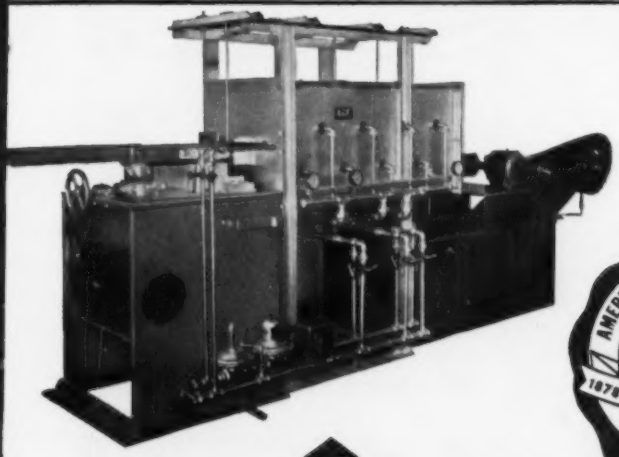
Compacting highly abrasive chemical powders, TALIDE pill dies last 4 months, steel dies wore out in 6 hours.



AGF FURNACES for STAINLESS

HARDENING ANNEALING BRAZING

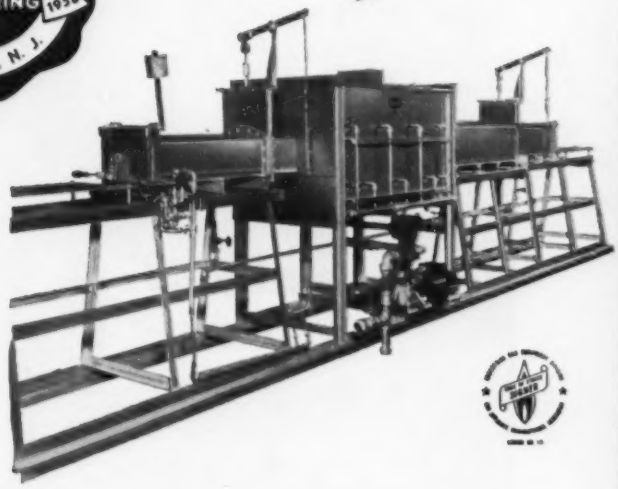
CONTINUOUS TYPE OR SEMI-CONTINUOUS BATCH



AMERICAN GAS FURNACE CO. 80 YEARS OF PIONEERING 1878 1958 ELIZABETH, N. J.

AGF SERIES 50 PUSH THROUGH MUFFLE FURNACES

permit bright annealing, copper and alloy brazing, atmosphere hardening of regular and stainless steels — and in addition silver soldering or annealing of ferrous, non-ferrous or precious metals. Full range of sizes available.

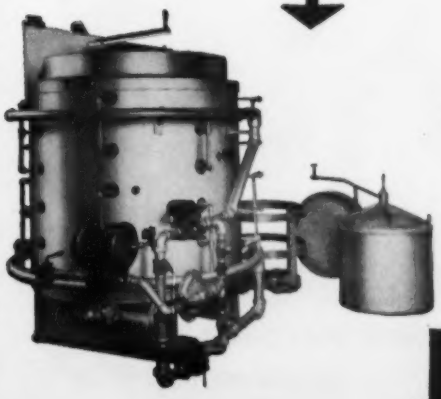


AGF SHAKER HEARTH FURNACES

provide automatic continuous bright hardening and annealing of stainless steel parts. These versatile furnaces feature automatic quenching and positive atmosphere control. Can be used without modification for clean hardening or light case carburizing of steel parts.

Highly versatile AGF Bell Retort Furnaces

for atmopsphere work at lowest cost with a minimum use of floor space. The use of multiple removable bell retorts provides semi-continuous operation. In addition to bright stainless work, these flexible furnaces without modification can be used for nitriding, Ni-Carbing and carburizing. Available in laboratory and production sizes.



"AGF Metallurgists and Engineers will provide recommendations for your proper heat treating installation at no obligation".

The furnaces illustrated are merely idicative of the standard AGF furnace designs which include Tube Furnaces for wire and strip hardening and tempering; Rotary Retort Furnaces for reduction of oxides, as well as a complete line of standard industrial heating appliances ranging from burners to completely automatic heat treating installations.

WRITE FOR EQUIPMENT CATALOG 80-A, REPRESENTATIVES IN PRINCIPAL INDUSTRIAL AREAS.

AMERICAN GAS FURNACE CO

1004 LAFAYETTE STREET — ELIZABETH 4, N. J.

NEW Starrett SAFE-FLEX® HIGH SPEED STEEL BAND SAW

Cuts up to 10 times faster...with up to 30 times longer life

This is the new Starrett SAFE-FLEX® Band Saw — a *high speed steel* band saw that cuts up to 10 times faster, outlasts ordinary blades as much as 30 to 1. Engineered for higher speeds and heavier feeds to cut harder and tougher materials with ease and safety, it pays for itself over and over in lower cutting costs, longer tool life and substantial material savings.

Red-heat hardness even at temperatures up to 1100° F. keeps this new band hard and sharp. Graduated hardness gives it super-hard teeth and a super-tough back. Thinner section (.025″ to .042″) lets it cut faster with less power and less chip loss.

Your nearby Industrial Supply Distributor has this new Starrett SAFE-FLEX® High Speed Steel Band Saw in Regular, Skip-Tooth and Hook-Tooth types. Call him for quality products, dependable service — or write for complete information. Address Dept. IA, The L. S. Starrett Company, Athol, Mass., U. S. A.

Starrett®

PRODUCTION-PROVED BAND SAWS

World's Greatest Toolmakers

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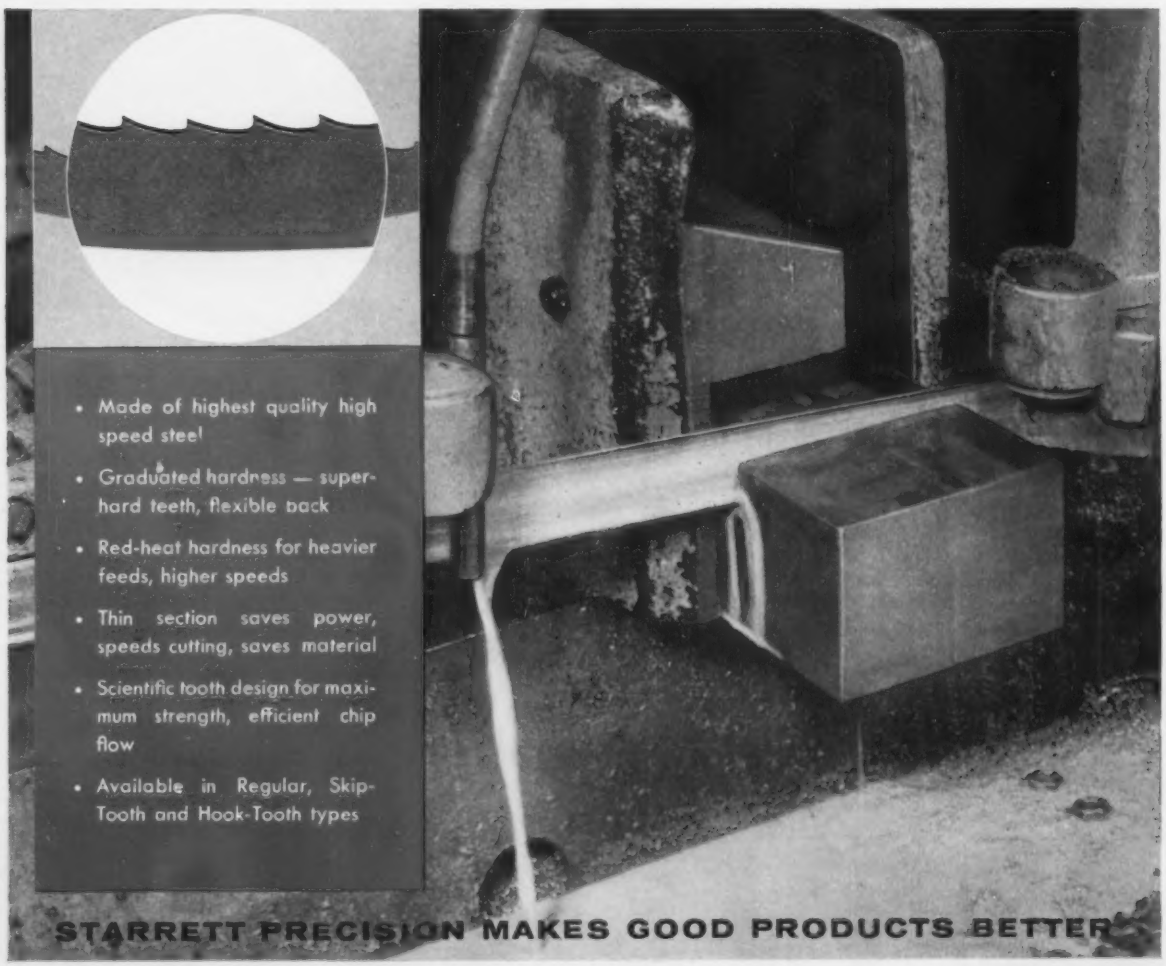
• Made of highest quality high speed steel
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• Scientific tooth design for maximum strength, efficient chip flow
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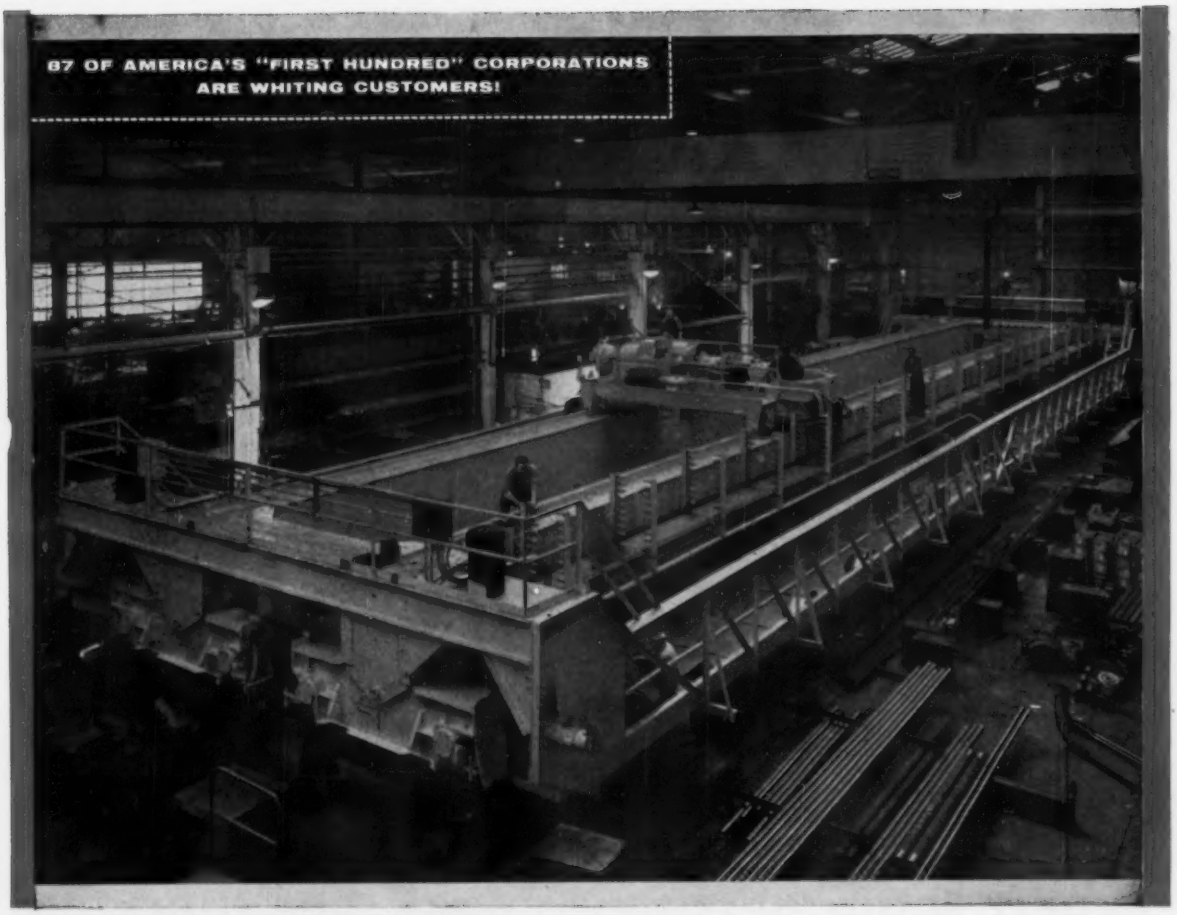
STARRETT PRECISION MAKES GOOD PRODUCTS BETTER

VISIT BOOTH 1401—ASTE TOOL SHOW . . . BOOTH 642 — Southwestern Metal Exposition



This fledgling crane wins its wings on the ground!

This steel mill crane is being assembled at floor level many miles from the place it'll eventually call home. Right now, it's the subject of a "look-see" at the Whiting factory. It's that all-important final look to be sure that every gear, every control, the hook, wheels, couplings, hydraulic brakes – everything – will operate at peak efficiency.

And when it checks out perfect it will be taken apart. Loaded. Shipped. Installed in the plant it's designed for, engineered for.

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For information on all the extras that make Whiting Cranes the best buy in overhead materials handling, write for Whiting Crane Bulletin No. 80. It's the way to investigate before investing. Whiting Corporation, 15601 Lathrop Avenue, Harvey, Illinois.

WHITING CRANES

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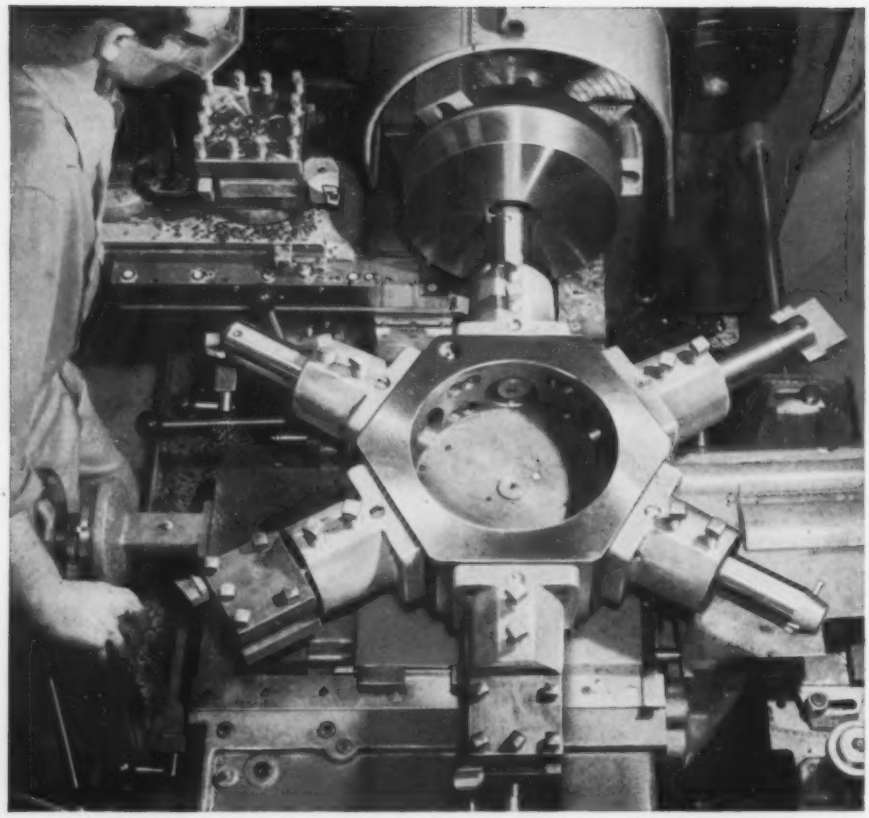

Expert setup gets more work per chucking

How manufacturer uses C/F turret lathe to produce variety of chuck bodies with only one tool change

To do the job, the manufacturer selected a Gisholt 1L Saddle Type Turret Lathe with a cross-feeding hexagon turret. A 15″ 3-jaw air chuck holds down chucking time. One set of adjustable serrated jaw bases handles the different workpiece sizes for first machining operations. A quick-indexing square turret on the cross slide carries turning, facing and chamfering tools, which work simultaneously with tools on the hexagon turret.

Three stub boring bars on the hex turret bore, counterbore, recess and back face. Because size is set with the cross-feeding turret, these same boring bars are used on different part sizes. Also on the hexagon turret are 2 box-type tool posts for facing, boring or recessing—used for different size workpieces because of the cross-feeding feature. A threading attachment lets the manufacturer thread the hubs, and a taper attachment handles up to 8 inches taper per foot when required.

The sixth tool on the hex turret, a spade cutter, is used for final sizing and is the only special tool changed for each job.

Simple, low-cost tooling combined with the cross-feeding hexagon turret offers maximum efficiency in handling various sizes of similar parts. The rugged Gisholt MASTERLINE Saddle Type Turret Lathes have the speeds, feeds and power to complete the work in the least amount of time. Call your Gisholt Representative today, or write Gisholt for literature.

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MOLY NEWS

CLIMAX MOLYBDENUM, 500 FIFTH AVENUE, NEW YORK 36, N. Y.

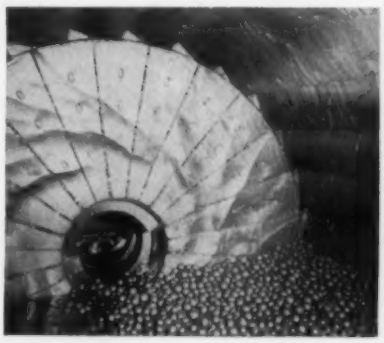
Chrome-Moly Steels Prove Ability To Resist Wear and Abrasion, Cut Costs

Can be Adapted to a Wide Range of Uses

To offset rising equipment and maintenance costs, the savings possible with wear-resistant alloy steels are receiving increasingly wide attention, in a growing number of industries.

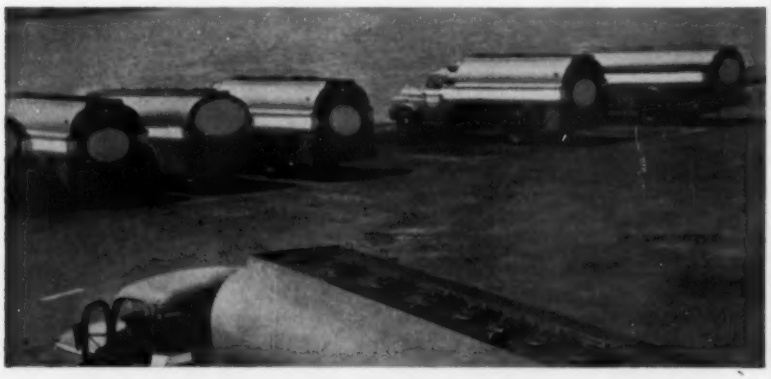
Two types of "Chrome-Moly" steels show exceptional resistance to abrasion and wear under toughest conditions. Both have substantially cut liner costs and shutdown time in grinding mills. Both are suitable for a variety of other industrial applications because they combine wear resistance, favorable first cost, freedom from premature failure by breakage or spalling, resistance to flow in service, consistently uniform performance and adaptability to specific designs.

The two types are Pearlitic (250-450 BHN) and Martensitic (450-700 BHN). Carbon and alloy contents and heat treatments of both types can be varied to suit specific applications.



Note that the spiral wear pattern is clockwise, even though the mill's rotation is counterclockwise. Type 2 Martensitic steel is used here.

For an article on the use of Chrome-Moly steels, send for "How to Select Chrome-Moly Steels for Ball and Rod Mill Liners" by T. E. Norman, reprinted from Engineering and Mining Journal. Circle #1 on the coupon.



New Use For Super-Strength Structural Steels

Today, gasoline trailer tanks are built of super-strength structural steels for a good reason. The steels have high strength/weight ratios. This factor enables builders to design tanks that carry greater payloads and still meet legal gross weight limits. And the extra capacity pays for the higher trailer cost in a few months!

This use is only one of countless possibilities for utilizing the steels' minimum yield strengths of 55,000 to 150,000 psi . . . and their many other desirable properties. *For more information, including tradenames and compositions, ask for "Super-Strength Structural Steels." Circle #2.*

Special Steels Solve Hydrogen Sulphide Problem

Hydrogen sulphide in France's Lacq natural gas field brought up a metallurgical problem: the need for tubing meeting the N-80 strength requirements but with better resistance to sulphide stress corrosion than the conventional N-80 grade. Two such steels have been developed. One contains chromium, aluminum and molybdenum; the other contains chromium, molybdenum and vanadium.

For articles discussing both steels, send for "A Special N-80 Steel Tubing . . . " by Cauchois, Didier and Herzog, reprinted from *Corrosion*, and "Comments on new French N-80 Steels" published by Climax. *Circle #3.*

Vanadium in Low-Alloy, High-Temperature Steels

Molybdenum is a must in low-alloy, high-temperature steels. However, recent tests at the U.S. Naval Research Laboratory point up the role of Vanadium in such steels, and show the effect of variations in composition and treatment. Addition of Vanadium results in a better high-temperature alloy, but getting the improvement requires higher normalizing temperatures.

The advantages and limitations are described in an *Iron Age article*, "Higher Vanadium Improves Hot Strength of Low Alloy Steel," by Paul Shahinian and J. R. Lane. *For reprints, circle #4.*

New Cleaner Removes Surface Oxides From Moly Metal

A practical, low-temperature method of cleaning molybdenum has recently been developed. It is especially suitable for removing surface oxides prior to welding. The process involves two chemical baths: one at 150-180°F, the other at room temperature. *Digested from "Ryan Devises Molybdenum Cleaner," Ryan Aeronautical Company. For reprints, circle #5.*

Sums Up Moly's Resistance to Corrosion

A new paper, "Corrosion Resistance of Molybdenum and Molybdenum-Base Alloys," based on published literature, summarizes moly's resistance to a number of corrosive media. It also lists the reference articles. For a copy of this paper, *circle #6.*

Molybdenum Improves Corrosion Resistance of Stainless Steels

Translated excerpts from two French articles discussing how moly improves the corrosion resistance of austenitic and austenitic-ferritic stainless steels are now available. *Circle #7.*

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For more information about Superior tubing, write for a free copy of Bulletin 40, "A Guide to the Selection and Application of Superior Tubing." Superior Tube Company, 2004 Germantown Ave., Norristown, Pa.

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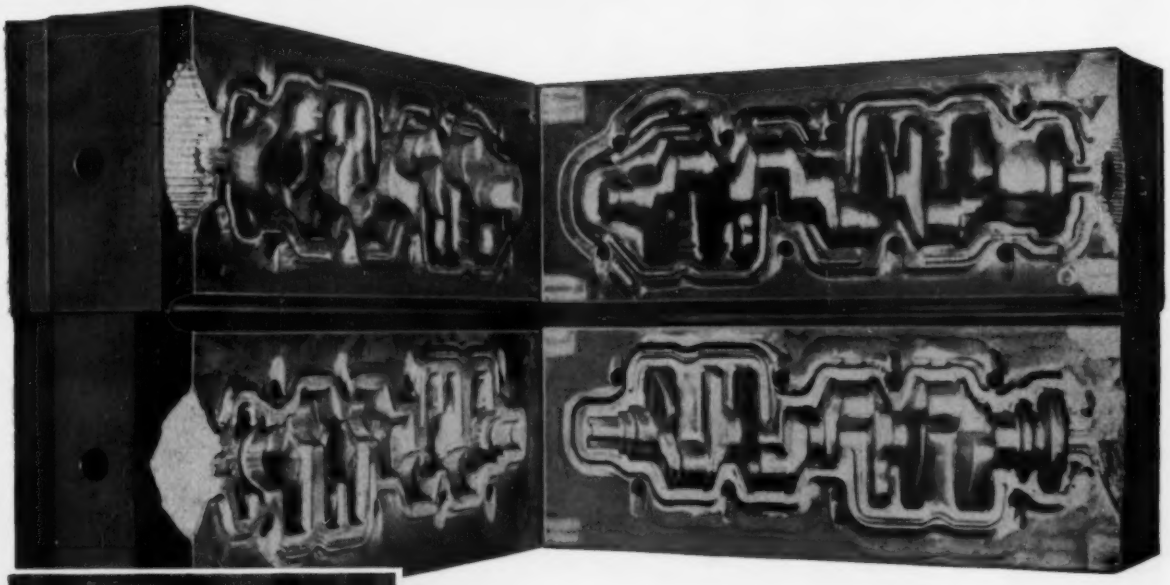

USE FINKL DIE BLOCKS FOR QUALITY FORGINGS

... the automotive industry does!

An upstate New York forge shop specializes in the forging of crankshafts, knuckles, and other high production items used in automotive production. Because the volume of each particular forging is very high, it is possible to evaluate costs and study tooling very closely

In the illustration above, the manufacturer is using Durodi for both the blocking and finishing crankshaft impressions in this forging press operation.

Durodi, made by Finkl electric furnace quality steel practice is a high volume producer and a most practical hot work tool for close die forgings. It hardens deeply and uniformly, is resistant to abrasion and withstands both shock and impact loading at high hardness. Its Special Machining Quality also appreciably reduces sinking time. All of these advantages mean more production at less cost.

Finkl die blocks are available in several grades, all sizes and tempers to handle virtually any forging requirement. Call your local Finkl representative next time you are considering die blocks or forgings. He will be glad to help you and there is no obligation.

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NEW!

WATERBURY FARREL SLOTTER

"Model 5"

DELIVERS UP TO 51,840 (BURR FREE) BLANKS PER HR....

SLOTS STANDARD & SPECIAL SCREW HEADS, FERROUS OR NON-FERROUS BLANKS #6 TO ¼" DIA., UP TO 2½" LONG, AT VARIABLE SPEEDS FROM 60 TO 864 PER MINUTE.

ONE "Model 5" Outproduces TWO Earlier Type Slotters

The speed and work range of this completely new Waterbury Farrel slotter make it more productive than a *pair* of earlier type slotters which used indexing dials and saw-into-work sequence.

The "Model 5" has long and short run versatility, too. Its simplicity and rapid set up make it economical for short runs while its high speed pays extra dividends on long runs.

Inexpensive Tooling

The only tooling required is a saw and burr-remover blades made inexpensively from spring steel. One dial, furnished as standard equipment feeds the above range of blank diameters. Special dials can be furnished for other blank diameters.

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Bolt, Nut & Screw Machinery

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WATERBURY FOUNDED 1851 FARREL

This jewelry chain of **COPPERPLY®** wire might give you a gem of an idea!

• Copperply wire, a National-Standard development, is a steel wire, electroplated with copper to required thickness and with unmatched coating uniformity and concentricity.

It makes sense for jewelry chain manufacturers to use Copperply wire instead of copper or brass wire, because material costs are greatly reduced. It also provides an ideal base for plating if desired, it excells in strength, and provides more footage per pound with resultant production and handling economies.

To date other uses in light coating weights include: wrapping for piano wires, reinforcement for eyeglass temples, decorative tinsel, fanning mill cloth, and springs where a combination of power and electrical conductivity is needed, A major use in heavy coating weights is in the field of communications.

Here we touch only briefly on a few of the unique Copperply features, but perhaps enough to spark an idea worth exploring. And you'll find that the word "cooperation" has real meaning at National-Standard . . . whether your interest lies in Copperply wire or any of our other products. Try us.

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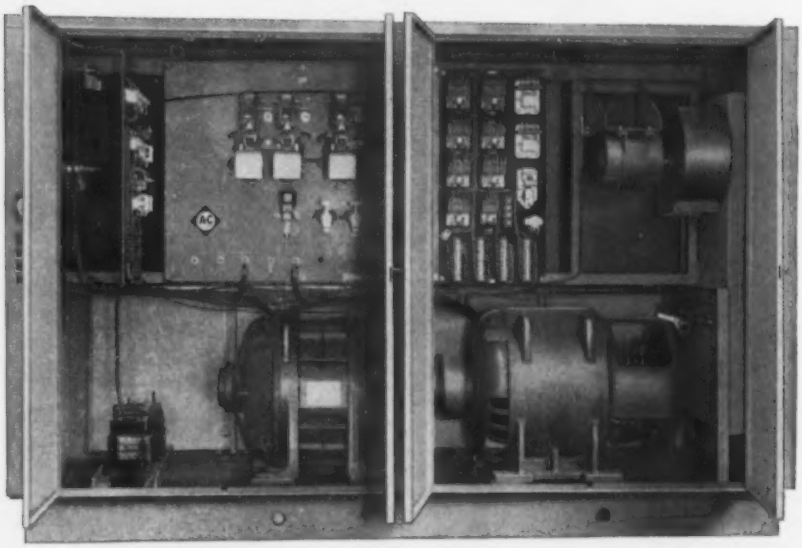
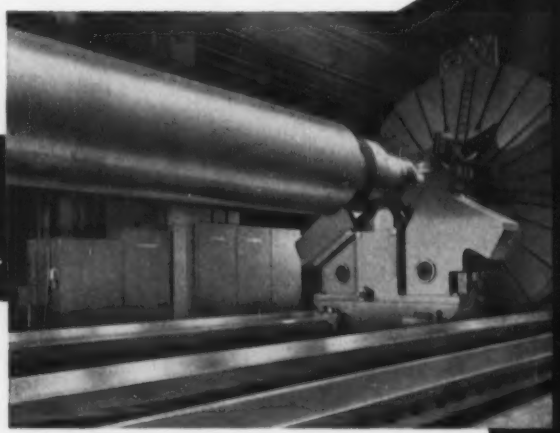
DIVISIONS: NATIONAL-STANDARD, Niles, Mich.; *fine wire, stainless, music spring and plated wires* • **WORCESTER WIRE WORKS, Worcester, Mass.;** *music spring, stainless and plated wires, high and low carbon specialties*
WAGNER LITHO MACHINERY, Secaucus, N. J.; *metal decorating equipment* • **ATHENIA STEEL, Clifton, N. J.;** *flat, high carbon spring steels* • **REYNOLDS WIRE, Dixon, Ill.;** *industrial wire cloth*

long-run power by Allis-Chalmers



Size 5 *Ultra-Speed* power unit, rated 125 hp, providing reversing and regenerative braking.

This 14-foot lathe uses constant speed and quick stops, starts and reversals.



New dependability in power conversion

Available in standard sizes 1 to 6, 5 to 200 hp., larger sizes on request.

Ultra-Speed — remember it! It's a name you'll be hearing more of in machine tool applications. It identifies Allis-Chalmers variable-speed package drive — the complete power conversion unit featuring wide speed range and continuity of operation.

Here, in a compact, filtered air cabinet, is all the equipment necessary for on-the-spot conversion. Components are precisely integrated. M-g sets are selected for exact horsepower requirements; magnetic amplifiers are provided for smooth, selective speed control.

Look to *Ultra-Speed* package drives for savings in maintenance and installation, and for longer tool life. Call your nearby A-C office, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wis.

A-C ALLIS-CHALMERS

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Ultra-Speed is an Allis-Chalmers trademark.

Steel Too Heavy to Fly?

Heavy steel containers now used by the Air Force for flying freight may be switched to a substitute built up of plywood and fiber board. The proposed new container would be reuseable and weigh about half as much as its airborne metal counterpart. Design work is said to be well underway.

King-Size Powdered Parts

What's said to be the world's largest press for making powdered metal parts is now in limited operation. Weighing 125 tons, and able to exert 6,000,000-lb pressures, the press can turn out parts up to 30 in. OD. Production rate of 100-150 large parts per hour is claimed, depending on the part size and the material used.

Tie Wear to Melting Point

Wear in metals occurs in a variety of forms, and about as many theories have been advanced to explain why, how and where it's apt to happen. Here's one that takes a new and surprising approach. It says, with supporting data, that wear is roughly proportional to the inverse of the absolute melting points of metals.

Unveil Aluminum Food Cans

Square, seamless aluminum cans are bidding for the frozen food container market. Some of the advantages claimed: (1) Square shape, good thermal conductivity speed freezing, maintain cold temperatures better, permit cooking or warming foods right in the cans. (2) Light weight, square shape, and a nesting feature in the can lids will cut shipping and storage costs.

Warehouses to Pour?

Continuous casting of aluminum might shape up as something light metal warehouses could use, according to one source. Low initial cost and flexibility of the process could make it useful in somewhat the same manner that steel warehouses use cold reduction mills to make up special orders. Volume considerations are still a problem in applying continuous casting to mill production.

Labor Gains: How Big?

Speculation is keener than ever on how labor settlements will go this year. One clue is a survey of 27 made in the Cleveland area thus far in 1958. It shows a weighted increase of 6.32 cents per hour for the more than 4600 employees involved. Fringe benefits and cost-of-living adjustments are not included.

Chide Missile Bureaucrats

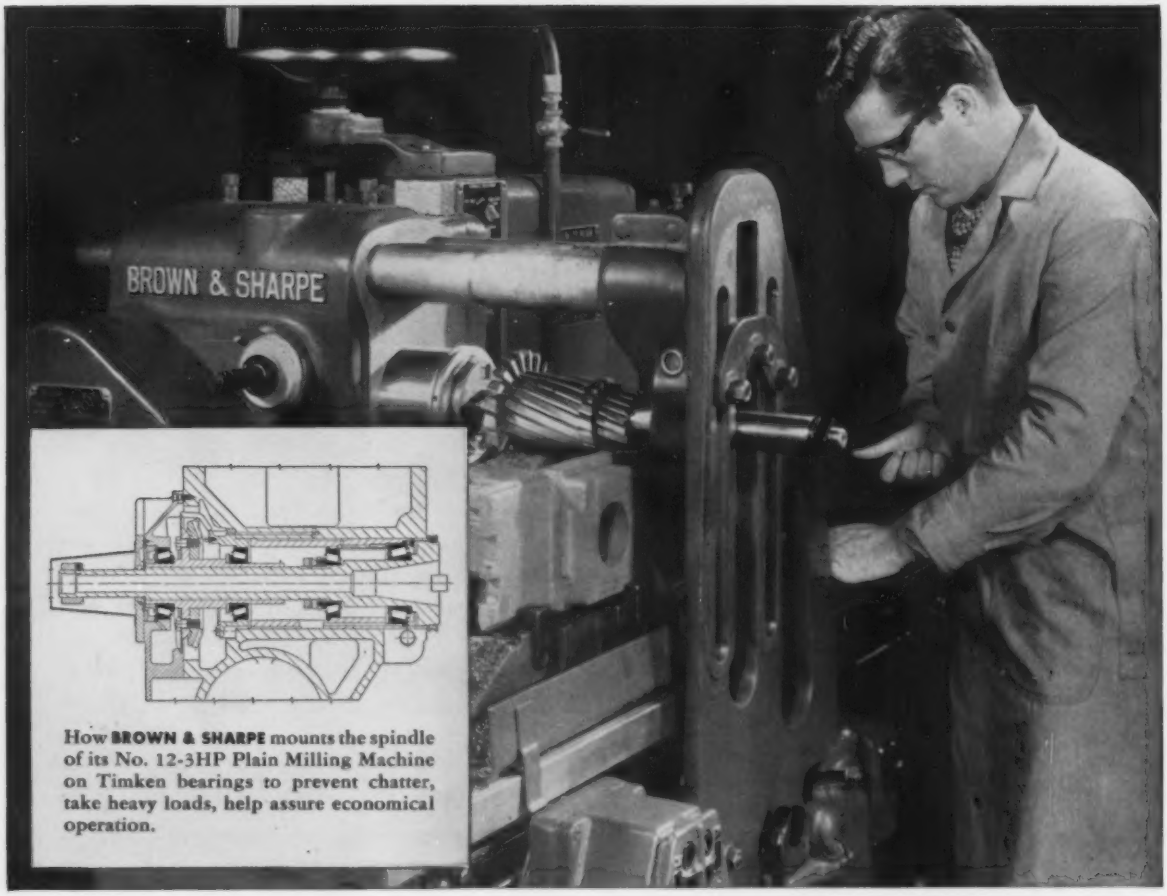
Congress is peeved over Pentagon blunders in missile planning and management. Defense Secretary McElroy admits too many cooks are spoiling the broth. (Minor government officials, many almost totally ignorant of missile engineering, are meddling in contractors' production problems). A drastic reduction in the list of bureaucrats permitted to issue orders to plants is coming.

Next: Brazing-Alloy Sheet

Significant forward steps in high temperature brazing technique are on the way. For example, sheet stock of brazing alloys suitable for elevated temperature service will be available soon. The material will range in thickness down to 0.005 in. nominal size.

May Order More Bombers

Look for the Air Force to boost its goal of B-52 bomber wings. Eleven are now scheduled, with 45 of the long-range planes for each. But since we have no transoceanic missiles, one or two more wings may be ordered. Part of the $1 billion-plus the Pentagon plans to add to its new budget request would supply this increased strength.



How **BROWN & SHARPE** mounts the spindle of its No. 12-3HP Plain Milling Machine on Timken bearings to prevent chatter, take heavy loads, help assure economical operation.

Climb mills both ways . . . TIMKEN® bearings prevent chatter in heavy cutting

TO make heavy cuts without chatter, Brown & Sharpe mounts the spindle of its No. 12-3HP Plain Milling Machine on two Timken® tapered roller bearings. For smooth power transmission, they use four Timken bearings in the bevel gear drive to the spindle. And to take climb milling's pulsating loads, two Timken bearings are used in the feed screw drive. Result—production milling is fast and accurate. Here's why.

• SPINDLE RIGIDITY MAINTAINED

Timken bearings hold the spindle in positive alignment. Their tapered design lets them take *both* radial and thrust loads in any combination. And full line contact between rollers and races gives Timken bearings extra load-carrying capacity.

• HEAVY LOADS ABSORBED

Rollers and races on Timken bearings are case-carburized to have a hard, wear-resistant surface over a tough, shock-resistant core. They take heavy loads and come back for more.

• FRICTION VIRTUALLY ELIMINATED

Timken bearings are geometrically designed to have true rolling motion and are precision-made to live up to their design. Practically friction-free, they last longer and run smoother. And to assure complete quality control, we even make our own electric furnace fine alloy steel. No other American bearing maker does. So for your No. 1 bearing value, always specify bearings trade-marked "TIMKEN". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

TIMKEN *TAPERED ROLLER BEARINGS ROLL THE LOAD*

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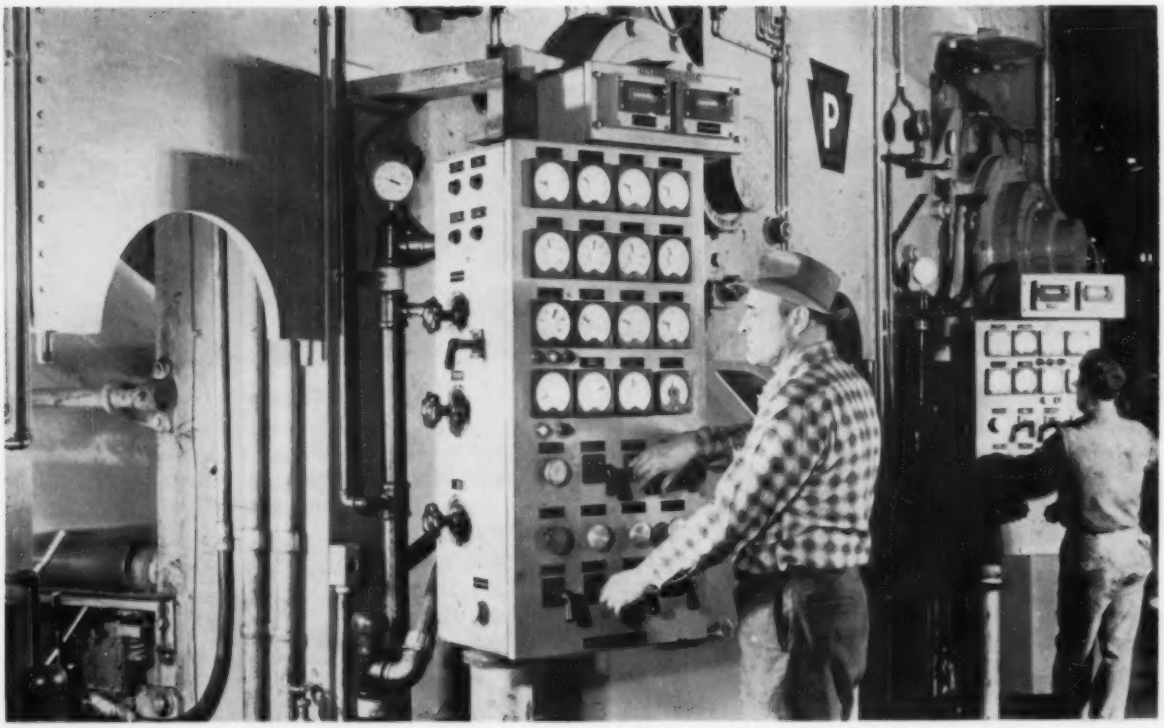


CHALLENGE MET: Automation has posed no serious problems in the setting of pay rates for steel workers.

Steel Pay Rates Meet Challenge of Growing Automation

Job classification system set up over decade ago proves its worth.

Worker responsibility is key factor in setting base pay rate. —By G. J. McManus.

■ Do workers move up or down the pay scale as a plant automates? How do you keep pay spreads fair and men happy in a period of quick improvement?

With these questions staring management in the face, one big industrial group offers some surprising answers:

1. Recent automation drives have neither upgraded nor downgraded the average worker.

2. Broad union participation has made for smooth job shuffling in periods of modernization.

3. Worker responsibility is one of the key elements in classifying automated jobs.

A Live Issue—So far, that's the way automation is shaping up in the steel industry. The issue is very much alive in steel. Punch card mills and other advances are raising questions on pay rates for electronic repair and related work. A labor-management team is reviewing the whole question of job classification.

But statistics to date indicate steel has found a smooth, sound formula for pegging jobs under changing conditions. Between 1951 and 1955, steel modernization brought a 14 pct increase in productivity. The startup of the completely new Fairless Works came in this period.

Modest Upgrading—In 1951, the average steel worker's job rating was 8.02; in 1955 it was 8.13. The gain was less than 2 pct and most of it

PASSING SCENE: Jobs like this are disappearing.

HEAT SHIELD: Workers observe oxygen furnace.

came at the bottom of the scale. Sweeping, cleaning and other labor functions were mechanized but the more complex type of automation apparently had little effect.

Another significant point: The transition involved in a 14 pct productivity gain was smooth. Between 1951 and 1955, only a handful of job classification grievances required outside arbitration.

Grievances Slashed—This record is particularly remarkable when you consider that prior to World War II, two-thirds of the grievances in steel rose from alleged wage inequities. Current harmony comes partly from the fact that steel's job system was installed and is maintained with full union participation.

Heart of the steel system is a catalogue of 230 specimen example jobs. These serve as guides to local groups in pegging jobs. More important, they have a force similar to legal precedents in resolving disputes.

How it Was Done—The initial group of specimen jobs was classified in 1945 and 1946 by a joint committee representing United States Steel Corp. and the United Steelworkers. Headed by R. Conrad Cooper (now executive vice president, personnel services) for the Corporation, and Elmer J. Maloy (now director of the wage division) for the union, the committee first reached agreement on a job description and classification manual. Then it began classifying specific jobs.

Over 150,000 jobs covering 450,000 men have been classified in the basic steel industry. Taking in fabricating shops and Canadian plants, 175,000 jobs and 600,000 workers have been classified under the steel plan.

Day-to-Day Operation — In current operation, new or changed jobs are classified by local company representatives. Local union officials are given a chance to approve or disapprove. Disputes go to higher levels and may be resolved ultimately by arbitration.

Steel management feels union participation in the program has worked very well. "There have even been cases where the union has rejected a higher classification for a job," says one industrial engineer. "This doesn't happen often, but enough to restore your faith in human nature."

Union Attitude—The union feels protection against automation has been built into the system by allotting over 50 pct of the total weighting to worker responsibility. This compares with a weighting of 20 pct for responsibility in the classification system of National Metal Trades Assn. In addition to the usual consideration for materials, equipment and safety, the steel system takes into account responsibility for operations.

"Jobs are classified strictly on the basis of job content," says Joseph Molnar, chief industrial engineer, wage and salary administrator for U. S. Steel, who has been administering the program since its development and inception. He points out that a classification system must be based upon the work assigned, that

How Steel Has Held to Pay Spreads

Contract Date	Base Increase	Increment	Wage Rates		Spread
			Job Class 1	Job Class 16	
1/13/47		3.5¢	$0.965	$1.49	54.40 pct.
4/22/47	12.5¢	4.0	1.09	1.69	55.05 "
7/16/48	9.5	4.5	1.185	1.86	56.96 "
12/1/50	12.5	5.0	1.31	2.06	57.25 "
3/1/52	12.5	5.5	1.435	2.26	57.49 "
6/12/53	8.5	5.5	1.52	2.345	54.38 "
7/1/54	5.0	5.5	1.57	2.395	52.55 "
7/1/55	11.5	6.0	1.685	2.585	53.41 "
8/3/56*	7.5	6.3	1.82	2.702	48.46 "
7/1/57	7.0	6.5	1.89	2.80	48.25 "

* Job classes 1 and 2 combined.

it is the job which is classified and not the employees who work on the job. Otherwise, no classification system can remain in effect and continue to be applicable.

Industrial engineers emphasize that although the problems can be exaggerated, any classification system requires strong policing.

Automotive Dilemma — While there may be some improper confusing of pay with classification, it is also possible that changing pay scales within an industry can work against the established job pattern. The skilled trades group of the automotive industry says across-the-board increases have had this effect for it. Six thousand tradesmen have organized to seek separate recognition and large differentials over semi-skilled workers.

In steel, most craftsmen were upgraded when the current classification system was installed. The pay scale applied in 1947 placed their wages at least 60 pct over the lowest labor grade. Top jobs like open-hearth first helper and blooming mill roller were pegged at double the lowest rate.

These relationships have been preserved through later steel contracts by constantly increasing the wage spread between different job classes. The initial increment was 3.5¢. In all but two contracts since 1947, this has been increased. Current spread is 6.5¢.

Confusion between pay scales and classification has brought the steel formula into disfavor in some circles. Companies feel the classification program has been used to apply the steel pay scale in outside industries.

At one southern plant, installation of the plan cost 75¢ an hour. A Pennsylvania company recently went through a strike rather than switch from the NMTA plan to the steel system.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th St., Philadelphia 39, Pa.

Asarco Casts Giant Copper Cakes

▪ Continuous casting plus arc melting is now producing tough pitch copper cakes up to 25 ft long and as heavy as nine tons.

American Smelting and Refining Co., which produces the cakes at its Perth Amboy, N. J., plant, says the process offers these benefits for copper users:

Advantages—The cake can be supplied in the optimum length for the customer's plant; metal cast by the method is sound and dense with excellent surface quality; and cake in long lengths and relatively small thickness can boost rolling mill tonnage while cutting scrap losses.

In operation, electrolytic copper is preheated in a gas furnace, then melted in what Asarco believes is the largest electric copper-melting furnace in existence. The arc furnace is 18 ft in diameter, with a bath capacity of 90 tons.

Bottomless Pit—Molten, the copper flows in runners to an electric holding furnace, from which it is poured continuously into a "bottomless" water - cooled graphite mold.

The copper cools so rapidly in the 15-in.-deep mold that it is a solid cake as it emerges from the bottom, where it is hydraulically lowered into a cooling well. The mold is continuously filled with molten copper until the cake is built up to desired length, to a maximum of 25 ft.

Graphite Mold — Heart of the process is the graphite mold, which has a heat dissipation rate of about 1500 hp. Asarco engineers believe this is the highest heat capacity of any mold ever built for either ferrous or nonferrous casting.

AT WORK: Copper flows through casting funnel into "bottomless" mold.

Aluminum Alloys Have Growing Pains, But Keep Going

Series 5000 aluminum - magnesium alloys are gaining ground in welded structural uses.

Needless overlapping of grades creates a problem, but the market has a natural area of growth.—By G. J. McManus.

▪ One of aluminum's big hopes is going through a problem-child stage at the moment.

The series 5000 aluminum-magnesium alloys are finding growing use in welded structural applications. They are going into tank trucks, railroad cars, ships, oil storage vessels and other tonnage markets.

This growth has come mostly in the last eight years, with the perfecting of inert gas shielded arc welding techniques. These techniques permit the fast, sound welding of aluminum. They make the magnesium series a natural for structural work.

Properties — The series 5000 grades are not heat treated, which means they require no re-treating after welding. They have high strength values in the annealed condition — up to 42 ksi (thousand pounds per square inch) against 14 ksi for alloy 3003. They are not susceptible to weld cracking.

These considerations led aluminum producers in about 1950 to start dusting off old alloys in the 5000 series and bringing out new ones. Their enthusiasm brought results, but it also led to a leap-frog competition that has created problems for mills and customers alike.

Competition Develops—Prior to the current spurt, alloy 5052 was used for most structural applications in the magnesium series. Early in the game, Alcoa began working with two added alloys, one in the intermediate strength range—5154—and one in the high strength range—5356.

Kaiser Aluminum countered with two alloys of its own—5086 and 5083—each slightly stronger than the Alcoa-backed pair. Alcoa then came back with a high magnesium grade that was stronger still.

Duplication Problems — As it stands there are six general purpose alloys in the series plus a couple that are being superseded and a number of special purpose grades. Most observers feel there is needless overlapping in the general purpose field, that the present six grades could be reduced to two.

For the mills, grade multiplicity tends to work against volume production. From a sales standpoint, customers are confused by the repeated changes in alloy grades and by the variety of grades available.

No Quick Clarification—The futile part of the whole situation is that none of the grades in question is patentable. Alcoa can and does sell Kaiser sponsored alloys. Kaiser may do the same with Alcoa grades. Some consolidation of grades will probably come ultimately but not in the near future.

For one thing, selling is too competitive today. The tendency is to give the customer exactly what he wants, to expand rather than reduce product lines.

Good Future—Alcoa and Kaiser are still split in their thinking as to how to get the most out of the 5000 series. In the upper strength ranges, Alcoa emphasizes chemical composition and uses little or no cold working. Kaiser feels there is a sharp limit on magnesium content and relies more on cold working. But whatever the disagreements and growing pains, all producers see a big future for the magnesium alloys. They point out that welding problems have been the major holdup.

Welding Development — After a promising start, aluminum dropped out of the picture in the late thirties when high tensile steels became available and frameless truck designs increased the importance of welding in tank construction.

Post-war development of the inert gas shielded, tungsten arc welding process made possible sound, nonporous welds with aluminum.

With these developments placing fabrication on a competitive footing, producers believe aluminum offers advantages in many fields where light weight carries a premium.

Where Aluminum Alloys Make Headway

Alloy	Min. Tensile Strength	Price (Cents per lb)	Typical Applications	Requirement
5456	42 ksi	51.5	Shipboard & equipment	Max. strength at joints
5083	40	51.5		
5086	[35	49.4	Dump truck bodies, tank trailers	Stiffness, overall strength
5154	30	49.4		
X5454	[31	49.4		
5052	25	46.3	RR tank cars	Min. thickness

Wheelabrator Gives $100,000 for Study

A new program of foundry education, supported by a $100,000 educational grant from the Wheelabrator Foundation to the Foundry Educational Foundation, was announced this week.

Commenting on the grant, Otto A. Pfaff, Board Chairman of Wheelabrator Corp., said, "We believe that under direction of the Foundry Education Foundation a sound plan to promote graduate study toward master and even doctorate degrees can be inaugurated and successfully administrated."

He pointed out that the program would have an important impact in producing top technicians and business leaders for the foundry industry.

Otto A. Pfaff

Three Aims Listed—The educational plan is set up to achieve three objectives:

Primary aim is providing 50 fellowships, each for $1500, for graduate school work. In addition, there is a provision extending to Canada an undergraduate program of foundry education similar to that developed in the U. S. And, lastly, there is a provision giving assistance to the Foundry Educational Foundation in activating new or extended educational ideas.

Min-K: A New Level In Insulation

▪ A new family of insulating materials may contribute significantly to faster, higher and farther flight of U. S. jets, rockets and missiles.

Developed by Johns-Manville researchers, the new material, called "Min-K" because of its low thermal conductivity, will perform the same insulating tasks as conventional fibrous materials in as little as one-third the space.

This could increase fuel capacity of rockets and missiles by as much as 20 pct. And industry can look forward to hitch-hiking a quick ride towards solution of heat transfer problems.

In Addition — Other qualities claimed for the new material include: 1. Thermal conductivity lower than any other known insulating material; 2. conductivity decreases with atmospheric pressure (the higher the missile goes, the better Min-K performs); and 3. smaller physical bulk widens design scope.

Thermal conductivity is actually below that of still air, which until now, has been considered a theoretical limit. The title Min-K is used to designate a family of products ranging from the 500 series for lower temperature applications to the 1300 series for high temperature service.

Wide range of Properties—Properties of the various grades cover a wide range of strength, thermal conductivity, density and temperature resistance. Min-K 1301, for example, is designed for extended service at temperatures as high as 1300°F. Combination with a reinforced plastic laminate permits even higher temperature use.

The new insulation is a bonded structure reinforced with fibrous media and containing "appreciable quantities of particulate matter, the ultimate structural elements of which are exceedingly small."

DEMONSTRATION: Wax missile model, right, protected by Min-K, melts far less rapidly than missile protected by conventional fibrous aviation insulation.

It also incorporates opacifying media which effectively minimize the transmission of radiant energy.

More Advantages — Bonding is reported to yield thermal and mechanical properties significantly superior than might be anticipated from purely mechanical mixtures of the components. And—an important plus—it permits molding the material into any desired shape to close dimensional tolerances.

Johns - Manville scientists believe they will find a wide range of industrial applications in addition to aircraft use. While all work to date has been on aircraft components, the company says it welcomes the opportunity to work with potential industrial users.

Behind GSA Mercury Dilemma

High-cost Flask Jeopardizes Buying Program

Government is able to buy only a fraction of mercury it planned on.

Cost of special flasks cuts supplier profit margins to near-breakeven point.

▪ Uncle Sam is jeopardizing his own mercury buying program.

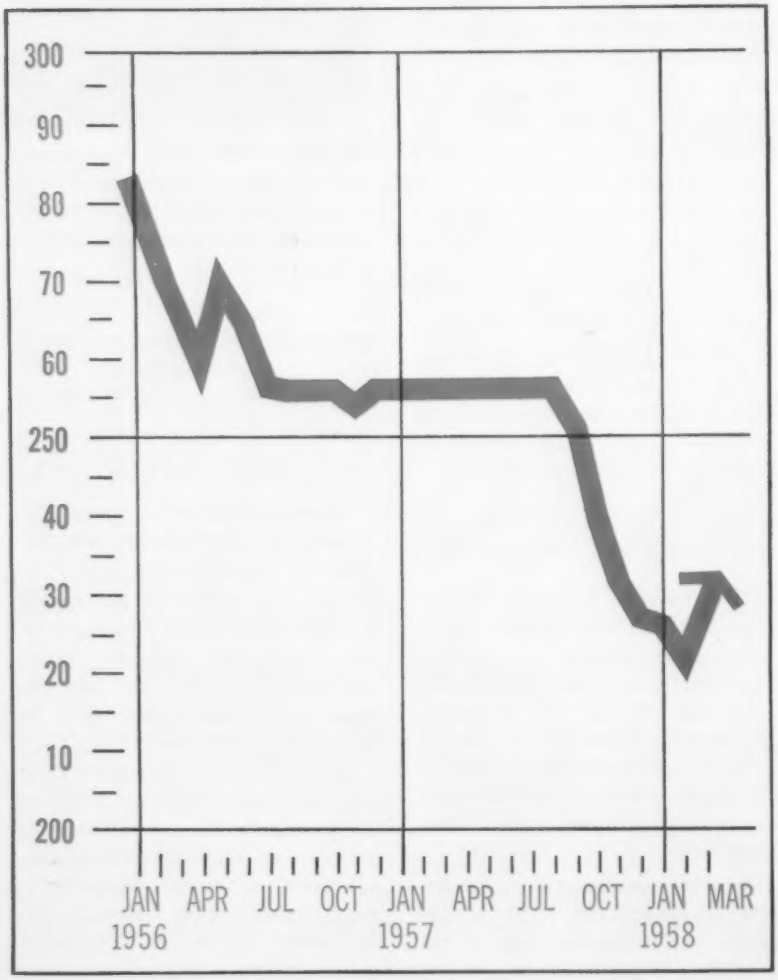
At the root of the trouble is the Government's insistence that mercury it buys be delivered in a new-type flask, the cost of which has narrowed the profit margin of domestic and Mexican producers.

Report on Problem—The General Services Administration now has a report from Stanford Research Institute which may solve its dilemma. The report has to do with specifications for possibly another mercury storage flask, presumably one that would be cheaper to make. GSA has no comment for the moment.

The new flask sells for from $4 to $6, depending on quantity bought. The old standard flasks are reused many times, changing hands for 75¢ to 80¢ apiece. Another drawback: Only two or three firms make flasks that are able to meet GSA specifications.

Is Mercury Price Slide Over?

Average price in dollars, 76 lb flask.



Program — Congress authorized GSA to buy 30,000 flasks of domestic and 20,000 flasks of Mexican mercury in 1957 and 1958. It set a price of $225 per flask, which at that time was considered fair by most U. S. suppliers. But the industry now argues that the higher price of the new flasks cuts the support price to $220.

A number of sellers say they would rather sell to private industry at this level because payment is faster and the old-type flasks can be used.

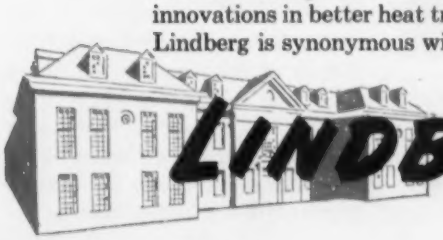
Last year, GSA was able to buy only 775 flasks from Mexico, and 9917 from domestic sources.

Market Firming— Industry sources say that if the Government goes back to the standard flask, or comes up with a less costly new one, its stockpiling problem will be eased—but not completely solved. The reason: Increased demand has boosted the market price of mercury to about $235 per flask.

Most suppliers are optimistic, say the current satisfactory levels should hold at least into the summer. But too many took loses in 1957 not to be cautious. They are keeping their eyes on (1) tempermental Spanish and Italian sources, and (2) new applications that could basically alter the structure of the market.

How to find a better heat-treating method

Here's a sound way to do it. Take your problems to the people who have consistently, over the years, provided the metal treating industry with new and better ideas, more efficient, more practical equipment. This will bring you to Lindberg, creators of the famous Cyclone type atmosphere furnaces, the long-life "dimple" vertical radiant tube, the revolutionary new CORRTHERM electric heating element and so many other innovations in better heat treating methods. Lindberg is synonymous with heat treating furnaces. We build them for carbonitriding, carburizing, hardening, tempering, normalizing, bright stainless annealing, brazing, carbon correction, nitriding, or any other metal treating requirement. Give your production processes the advantages of Lindberg's forward look in "heat for industry" techniques. Get in touch with your nearest Lindberg Field Representative (See classified phone book) or write Heat Treating Furnace Division, Lindberg Engineering Company, 2452 W. Hubbard St., Chicago 12, Illinois.



LINDBERG heat for industry

Refuse Speedy Review Of "Memphis Case"

A controversial lower court decision in the "Memphis Case" which seriously hurt the linepipe market won't be settled by the U. S. Supreme Court until next winter.

The high court turned down government and gas transmission industry pleas for an unusual quick hearing in the case involving United Gas Pipe Line Co. and the City of Memphis, Tenn. The lower court had ruled the Federal Power Commission could not accept gas pipeline contract rate increases without the consent of all customers.

What the Ruling Means—Effect of the lower ruling is to require pipelines to use a rate-making procedure which takes from three to five years. If upheld, it may require pipelines to refund some $224 million in higher rates collected over the past few years.

The decision of the lower court threw the gas pipeline industry into a virtual panic, halting construction plans running to hundreds of millions of dollars.

Wait for Review—However, the FPC has announced it will not follow the lower court ruling until the Supreme Court reviews it. In the meantime, the Commission is continuing to accept, and grant, pipeline applications for higher rates, under the disputed procedures. Higher rates are being approved under special bond to insure refunds if the procedure is thrown out by the Supreme Court.

The gas industry, privately, is not optimistic about chances the high court will overthrow the Memphis decision.

The most serious effect of the lower court ruling would be the order to refund higher rates collected over the years, and the initial lag getting the rates restored.

New ASM Home Is Design Masterpiece

MODERN DESIGN: The new American Society for Metals headquarters, being built near Cleveland, will feature an aluminum geodesic dome or "space lattice," a semi-circular building of steel and concrete, and a garden piazza. W. H. Eisenman (left), who contributed the land, discusses the $2 million project with architect John Terrence Kelly.

SUB Battles Rage

Steel's SUB plan was given a tentative go-ahead in Ohio; a test is shaping up in Indiana.

An Ohio common pleas judge ruled that SUB should not interfere with state payments. In a case brought by the United Steelworkers, he set aside an order that denied state payments.

But state compensation administrator James Tichenor says he will ask for a stay of execution and appeal the matter to a higher court. This would mean a further delay in Ohio SUB payments.

New Hoosier Law — Indiana has a new law specifically directed against concurrent state and SUB payments. The steel industry has come up with a plan that calls for the mills to make full compensation for a period, then to employ a system of alternate payments.

Fund depletions brought the alternate plan into play for most affected mills early this year. The state went along with the first set of payments but plans to bring the matter before a board of review.

Titanium Shows Gain

A modest spurt in titanium shipments has cheered producers and placed new hope in the future of the metal.

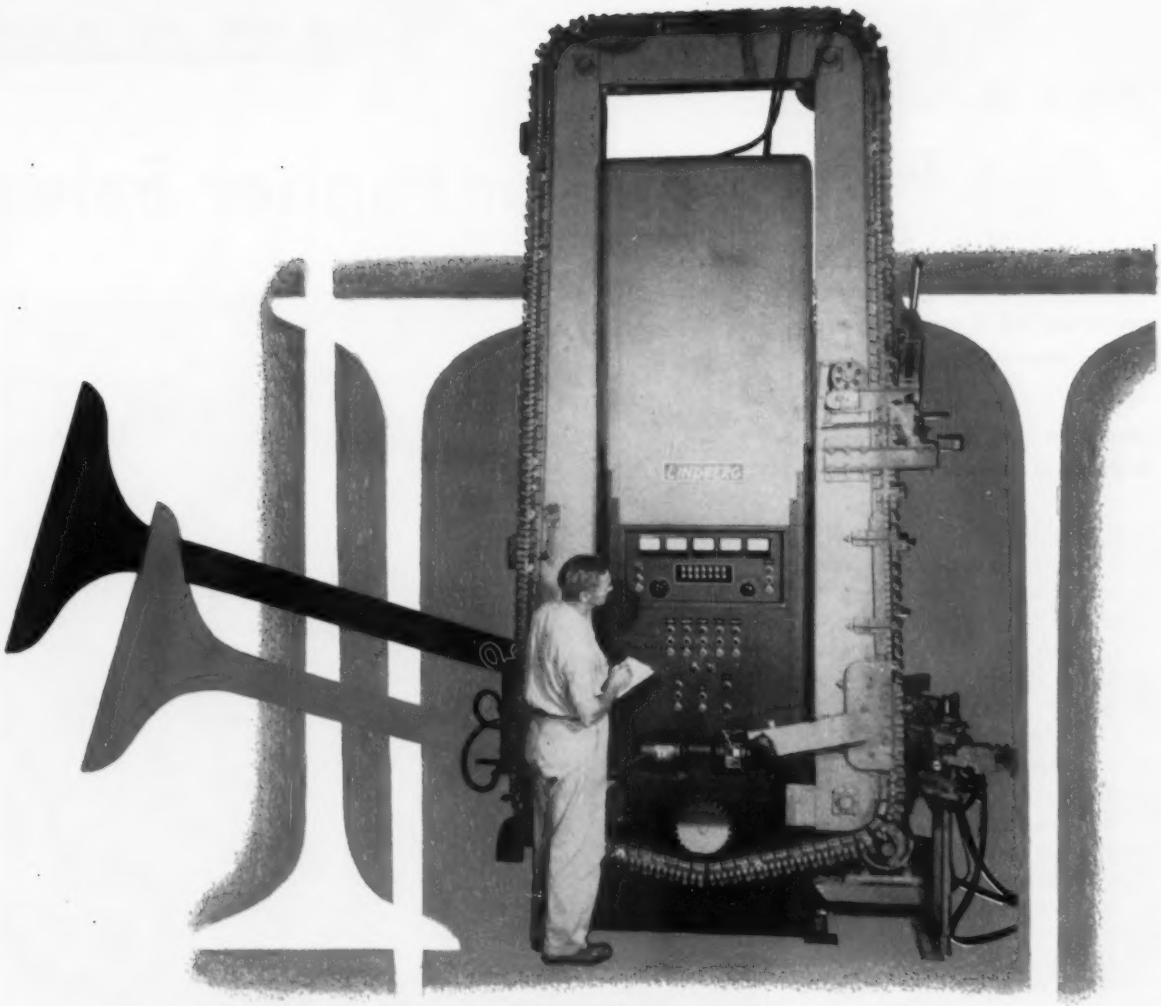
Three points emerge from recent developments:

Inventory cuts played a big part in last year's abrupt drop in titanium.

Loosening of government dollars is starting to bring a pickup in military production.

Titanium producers are saying they can survive the military reversal.

The industry shipped only 761,000 lb of the metal in the fourth quarter of 1957, and was looking for the first quarter of 1958 to be even worse. But new orders indicate that shipments in the current quarter will top one-million lb.



Lindberg pioneers in High Frequency Heating

Along with its pioneering in all phases of "heat for industry" Lindberg is one of the largest makers of High Frequency heating units. Our "H-F" designers and engineers have made outstanding developments in this important heat treating field. For example, we illustrate a remarkable unit just recently completed for aluminizing automotive valves. It was designed vertically, saving 60% of floor space, and is completely automatic. No operator is required. It fits perfectly into an automated production line.

Our High Frequency Division provides units for hardening, brazing, heating for forging and forming, annealing and many other processes, and designs a variety of fixtures for application to "H-F" units. Lindberg also supplies a complete line of motor generators for all induction heating and melting applications. Get in touch with your nearest Lindberg Field Representative (See classified phone book) or write High Frequency Division, Lindberg Engineering Company, 2452 W. Hubbard St., Chicago 12, Illinois.

LINDBERG heat for industry

Arthur M. Perrin

He Engineers for Higher Sales

Bidding against industry's giants can be tough going for a small company.

Here is one way the small shop can get the percentages working in its favor.

▪ A small company may not be able to invest large sums of money in production equipment, but it can compete effectively with the industrial giants in other ways, says Arthur M. Perrin, president of National Conveyors Company, Inc. For one thing, it can match the large competitor in the brains it hires.

"By investing our money in top engineering personnel . . . we believe we have the best opportunity to beat competition," states Mr. Perrin.

Policy Proves Out—He estimates that since the company began emphasizing this policy three years ago the productivity of the engineering department has increased over 60 pct. "We are turning out superior jobs at lower costs," he explains.

Furthermore, his company flourishes on specially-designed material handling systems. Today's "custom built" equipment, he explains, often becomes tomorrow's standard equipment.

Need for Creativeness—"In doing its job, we expect the engineering department to reduce its operating costs to a minimum, and to provide information to other departments so that they also can operate at top efficiency," he adds.

"For without a creative engineering department our company would be limited to the use of existing designs and further company growth would be difficult."

ARTHUR M. PERRIN: Invest in top-flight personnel.

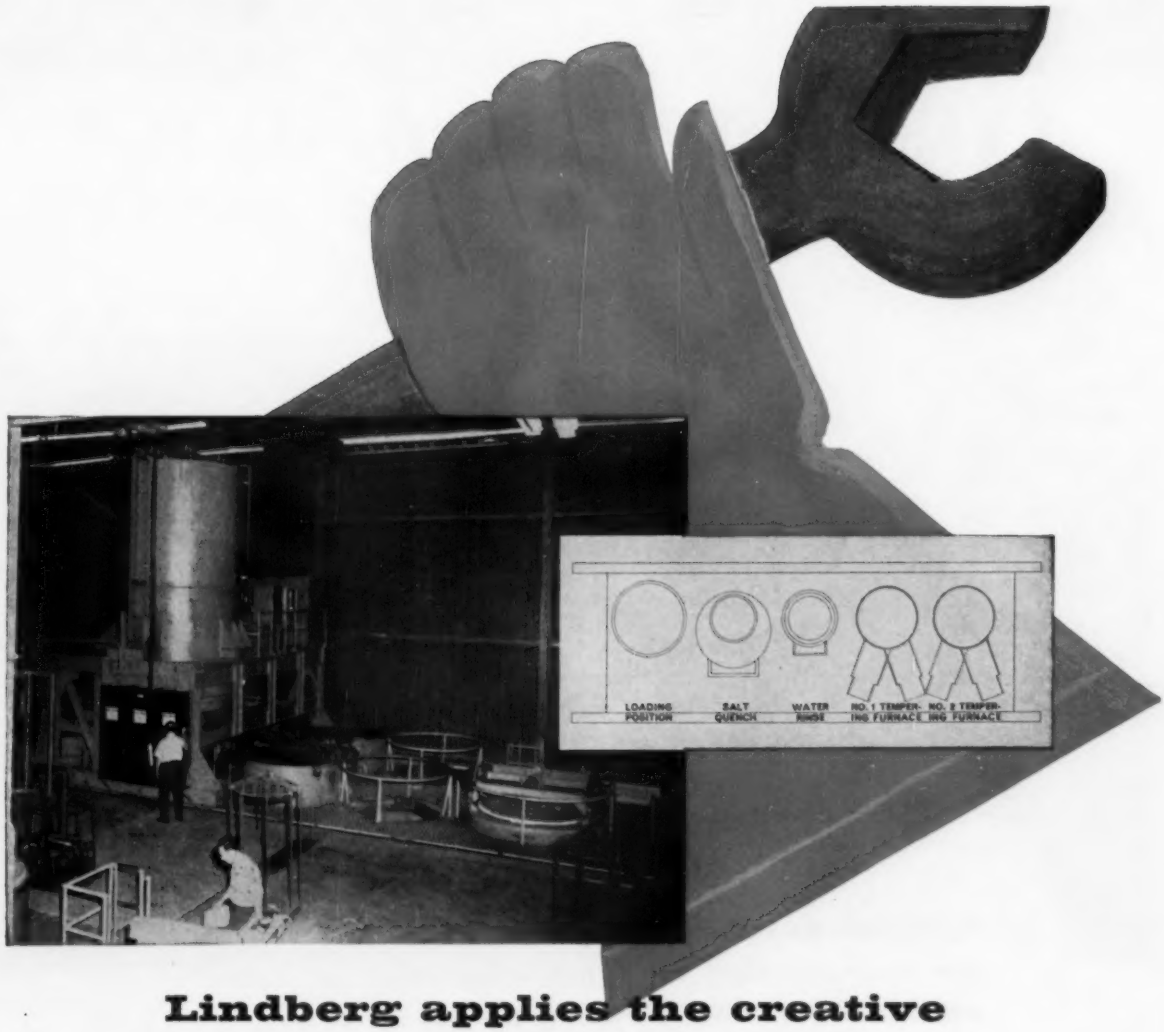
Mr. Perrin himself is a top-flight engineer. He recently was elected to the grade of Fellow in the American Society of Mechanical Engineers. ASME cites his contributions to the development of professional activity and engineering management both nationally and abroad.

Management's Job — While he stresses the importance of an efficient engineering staff, Mr. Perrin doesn't place all the burden on the slide rule brigade.

"First, we recognize it's management's responsibility to keep the engineers engaged in useful work. In our industry, valuable engineering time can be wasted preparing bids on poor or doubtful prospects. Therefore, we carefully evaluate each prospect before we decide to bid the job," he explains.

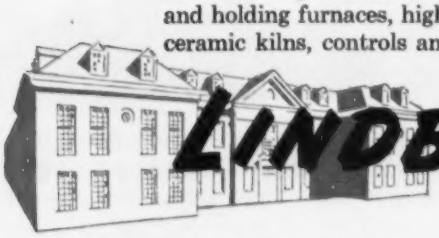
Drawing Economy—To help decide on whether to bid, the company maintains a well-equipped laboratory where pilot plant operations can simulate conditions at the customer's plant.

Since Mr. Perrin helped establish National Conveyors 25 years ago, he has seen engineering efficiency help the company grow into a flourishing, medium-sized firm.



Lindberg applies the creative touch to field-installation

Here is an example of Lindberg's creative touch in field-installed heat treating equipment. Our unique design of this movable overhead furnace saved space, labor and time and increased quality and operating efficiency in missile manufacturing. We have the technical staff and the experienced engineers to design and install for you any requirement you may have for the application of heat to industry. Our service covers all types of heat treating furnaces, aluminum melting and holding furnaces, high frequency units, ceramic kilns, controls and all facilities required to fit this equipment into your production processes. We specialize in "turn-key" operations covering everything from design and engineering to the finished job installed in your own plant. Whatever your industrial heating problem, a good way to solve it is to talk it over with Lindberg. Just get in touch with your local Lindberg Field Representative (See classified phone book) or write Lindberg Industrial Corporation, 2321 West Hubbard St., Chicago 12, Illinois. Los Angeles Plant: 11937 S. Regentview Avenue, at Downey, California.



LINDBERG heat for industry

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Where Recession Hits Hardest

It's no recession in the durable goods industries. It's a real depression.

Unemployment increase in past year is almost 80 pct within this sector of business. Metalworking is critical.

▪ A look at employment figures; or better still, unemployment figures, underscores dramatically where the roots of the recession lie—the durable goods industries.

Unfortunately, that is bad news to metalworking. Directly or indirectly, most metalworking plants, regardless of size, are tied in with durable goods. As that economic sector fluctuates, so does the metalworking industry.

Facts and Figures—First, here's a rundown of the employment situation. Comparing January, 1958 with January, 1957:

80 pct of the increase in manufacturing unemployment is in durable goods.

Sharpest declines in the work week occurred in primary metals, down 3.2 hours; transportation, down 2.6 hours; and machinery, down 2 hours.

Sharpest drops in weekly earnings occurred in primary metals, down $5.26; and transportation equipment, down $2.60.

In overall manufacturing, the factory work week declined only 1.5 hours and hourly earnings were down only $1.14.

The decline in weekly earnings is even more significant in that overall hourly earnings were up 5¢ per hour. The increase probably was almost twice that in the primary metals and automotive areas.

Two Big Causes—What caused the sharp drop in this segment of the economy? Immediate cause was a drop in buying of consumer durables plus the decline in outlays for new plants and equipment.

Metalworking is almost entirely dependent on these major markets. As a result, metalworking is deep in a decline far greater than the national average.

Factory payrolls actually dropped 450,000 in January, the bulk of the decline again occurring in durable goods industries.

Overall, employment is still good, earnings high, and spending for services and non-durables excellent. Keeping the gloom that besets the metalworking industry from spreading is now the big job.

. . . Is Confidence Enough?

Lots of Theories—Almost everyone has a theory of what will bring the durable goods industries out of their depression.

Some over-simplify it with terms like "a good dose of confidence," or "some old-fashioned selling." On the other extreme are those predicting a real depression who believe that it will have to run a full cycle.

Income Needed—Sumner Slichter, the Harvard economist, believes the recession will end when there is a rise in income-determining expenditures. He refers to Federal, state, and local government outlays for goods and services and income from private investments.

Some of this is under way, of course. The government has eased money with an appreciable stimulus in home building. Defense Dept. orders will start having an effect, although this is likely to take a little longer than formerly believed.

Public Works Drags Out—The same is true with public works. It takes a long time for money appropriated for public works to make its way back to the consumer. There is an earlier effect in stimulating equipment and materials.

Another factor in the public works programs: They are unlikely to attract most of the workers who are now laid off. An auto or steelworker with union seniority, for example, is immobilized to a great extent, as are many others.

Employment Outlook

Good and Bad—The employment outlook is both encouraging and discouraging.

A Dept. of Labor survey turns up these general conclusions of some employment projections.

The aircraft industry will probably undergo the sharpest employment drop in March of any industry group. In the next few months, employment losses are expected to be less than during the close of 1957.

Further downtrends are likely in the auto industry in March.

Steel producers look for a stabilization of employment with some local pickups expected.

The fabricated metals industry also looks for some gains in employment in March. Farm machinery makers expect some seasonal hires in the spring.

a moment with management . . .

THE GREAT TESTING FALLACY

Testing is a wonderful thing. It keeps any manufacturing mistakes from ruining your reputation. It protects your customers from trouble and danger. It saves you the embarrassment and high cost of explaining, apologizing and correcting.

But testing that does these things, **and only these things,** misses a vast opportunity to save money and build profits for a manufacturer. It even hurts the customer, for it fails to give him the perfect buy of a sound product **at a minimum price.** For inevitably the price must reflect any **manufacturing waste.** Some part of the loss always gets passed along. The poverty is shared, so to speak.

What are we getting at? Simply this: End inspection is merely locking the door after the horse is stolen. Or, in plain shop language, finding out that you have already spent a lot of unnecessary money working on pieces predestined for the junk pile.

How much is wasted? It is the cost of all operations performed on the piece beyond the moment when an adequate testing procedure could have spotted the defect.

Final tests are unavoidable, essential. **But never enough.**

Manufacturing horse sense requires a testing setup that will spot defects at the earliest possible moment during process.

That means before the following algebra has time to get in its dirty licks:

$$W\text{-}H\ (L + O)$$

or

$$\text{Waste-Hours} \times (\text{Labors} + \text{Overhead})$$

Such waste can add up to thefts of profits far greater than any ever dreamed of by the Forty Thieves of Ali Baba mentioned in our neighboring column.

Ali Baba only had 40 thieves

...and they could be cured through a light application of boiling oil. Chances are, most manufacturers have more than 40 unwitting thieves in operation at work in the plant. They won't be neatly aligned in so many stone jars, but these phantom pilferers are there nonetheless.

You'll find them "accidentally" whittling away at profits in many ways. Check your own operation...are reject rates reducable...have you need for continual rework...are you afflicted with machine downtime...how about scrap losses from defective materials, are they there, too?

True, each may only chisel a few dollars a day, but when you find them at work in scores of operations they add up. Their total may be a serious profit drain which can be plugged to achieve maximum return on your investment.

Magnaflux sells nondestructive test systems which pinpoint faulty materials and processes *before they start costing extra.* These new production tools are used to find defects at any stage of "in-process" operations. Thus they curtail wasted time, labor and materials. These industrial "burglar alarms" can protect profit margins and control consistent product quality, too!

Send for a copy of LOWER MANUFACTURING COSTS—our new booklet which explains where, when, why and how Magnaflux tests can help cut production costs.

moral: Oil can keep things running smoothly, but it takes Magnaflux Test Systems to keep them running profitably!

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Are Tensions Getting You Down?

Every businessman has his tensions. Whether they are excessive or not depends on many factors: Personality, work and attitude toward it, family life, personal habits, and many others.

To learn more about tensions, The Life Extension Foundation, Inc., New York, a non-profit organization for research and education in preventive medicine, conducted an extensive survey of 10,000 business executives.

Completed survey questionnaires were received from more than 6000, indicating the intense interest among businessmen in the subject of tensions.

The results are the basis of this special survey report. Especially for The IRON AGE, a group termed the Manufacturing Group was singled out. It includes production, procurement, engineering, research and general management executives.

Comments and background information are supplied by Harry J. Johnson, M. D., president of the Foundation. Included is Dr. Johnson's checklist to evaluate your own tensions, and what to do about them.

How Executives Work

Business Habits Are Generally Good

In spite of tensions that most executives attribute to their job, most of them follow sensible work schedules.

This is what the survey shows about working habits, as reported by Harry W. Johnson, M. D., president, Life Extension Foundation.

▪ Take the case of HTL, a 29-year-old assistant personnel director.

When his boss was assigned indefinitely to a special project, he assumed departmental responsibilities.

Inexperience Hurt—Long on ambition and with an opportunity to prove himself, he was soon working 10 hours a day. He was laboring over decisions made difficult by his inexperience.

Soon he developed insomnia and abdominal pains. When he came to Life Extension Examiners through his company's health program, examination X-rays detected a large gastric ulcer.

Through hospitalization, the ulcer healed, but he was cautioned to make significant adjustments to his work habits. He returned to his work a wiser executive.

How Typical?—Is the case of HTL typical of the tensions developed by the average manufacturing executive?

Not according to the Life Extension Foundation Survey. The average executive in production, purchasing, engineering, research and general management takes pretty good care of himself and follows a sensible routine.

Excesses Avoided—Tensions do result from the increased pressures of today's competitive situation. For the most part, the manufacturing executive is able to lay out his work to avoid excesses.

Starting out first thing in the morning, 60.4 pct take their own car to work, 25.9 pct take the train, and a full 6.5 pct are able to walk.

Only 15 pct spend more than two hours a day commuting while over half spend less than an hour on the road between work and home.

Early Starters—It may be surprising, however, that over 50 pct of the group get to the office by 8 a.m. But this is in line with the 5 p.m. quitting time that 60.4 pct have adopted. However, more than a third stay on until 6 p.m.

This means that the average day is long, from the time the executive leaves home until he arrives there in the evening, but not up to the back-breaking level in most cases.

Over half take work home only occasionally, spend less than 5 hours a week working at home. Sixteen pct do no homework, but 18.7 pct do from five to 10 hours. A smattering of 4.4 pct actually spend from 10 to 15 hours on homework and a nose-to-the-grindstone 1 pct work over 20 hours on business homework.

Business reading is becoming an important factor in business today. It accounts for 37.5 pct of homework.

Business lunches are an accepted fact-of-life of business, but over 60 pct of manufacturing executives average one or less a week. About 22 pct average two a week, with the percentage dwindling to the 2.4 pct of incurable business lunchers who carry the office to lunch five days a week.

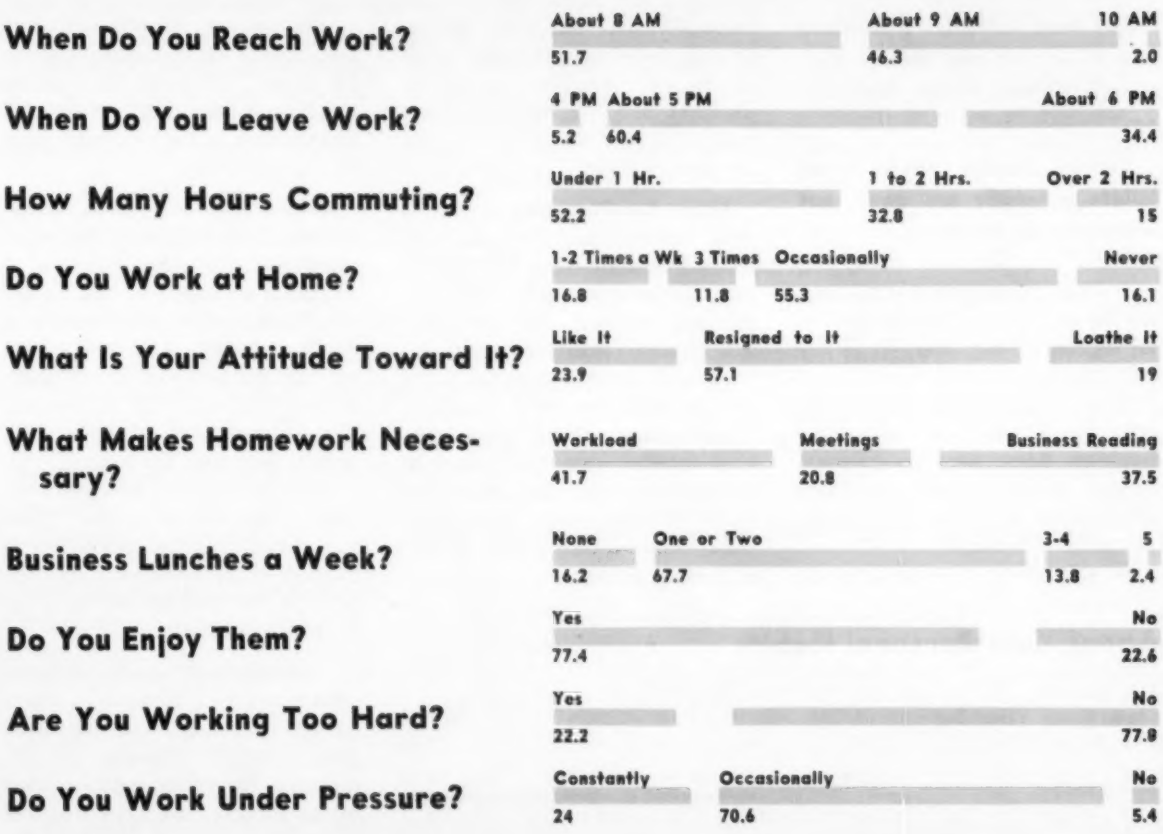
Enjoy Those Lunches—Although they may grumble about it to associates, more than three-fourths admit to the confidential survey that they enjoy their business luncheons.

The majority enjoy their evening and week-end business entertainment. Fewer go in for this after-hours entertaining, however.

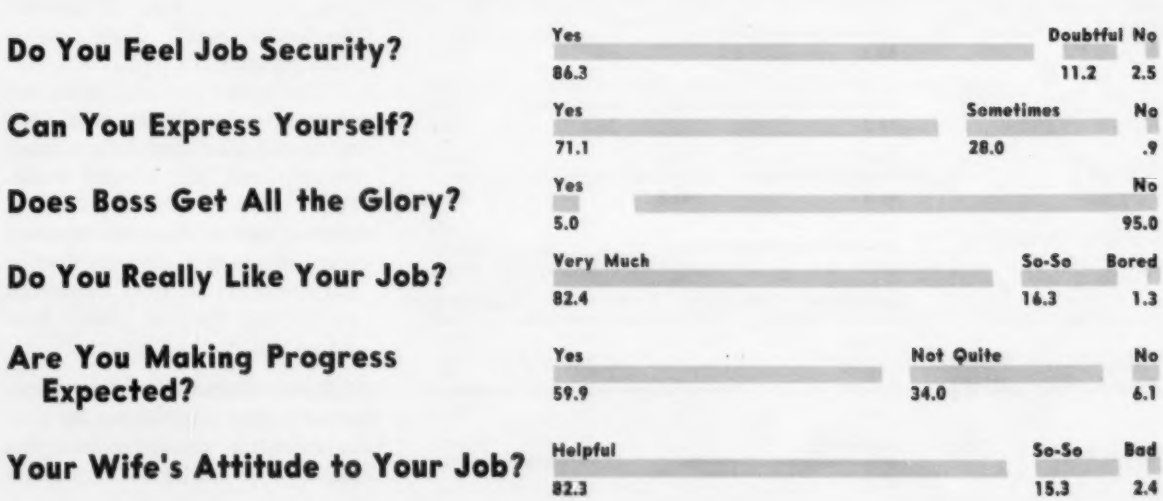
Only 8.7 pct spend as much as 10 days a month on the road for business trips: 17.6 pct spend five to 10 days on business trips, with 41.6 pct spending less than five days. **(Turn Page)**

Do Work Habits Contribute to Tensions?

In Pct of Replies



What About Job Attitudes?



How Executives Live

Personal Problems Are of Greater Concern

The busy executive frequently can trace his tensions to personal problems, rather than business.

Survey results show living habits generally are good, but often can be improved.

▪ It's well established that tensions are the reaction of the individual to all aspects of life. His job is just one aspect.

This focuses attention on the other facts of life of the busy executive—his home life, his personal habits, worries about conditions other than his job, recreation, plans for retirement.

In this group of manufacturing executives, over half work in cities of over 500,000. Average age is 46 to 50. Average income approaches $15,000, with a sizable number in the $20,000, $30,000-and-over bracket.

Many Are Concerned — Among these businessmen, 16.5 pct have unusual concern about their health; 17.7 pct are concerned about their personal finances; 13.3 pct have worries about home problems.

Arrayed against these, 24.6 pct are concerned over office problems.

This indicates that personal problems together rate well ahead of job problems in creating excess tensions. For this reason, it might be worth while to take a look at general living habits.

About Your Personal Habits

Pct of Replies

How Much Time Do You Devote To:				
Breakfast	Under 5 Min.	5 to 10	10 to 15	Over 15
	7.8	31.3	42.0	18.9
Lunch	Under 15 M.	15 to 30		Over 30
	7.0	52.4		40.6
Dinner	Under 15 M.	15 to 30		Over 30
	1.0	41.4		57.6
Do You Have a Cocktail Before Meals?	Yes			No
	50.2			49.8
If So, How Many?				
Lunch	One		Two	Three
	66.5		28.1	5.4
Dinner	One	Two		Three
	41.9	43.8		13.6
Do You Smoke?	Yes			No
	63.8			36.2
Packs per Day	Less Than 1 Pack	1 to 2 Packs		2 or More
	34.8	59.7		5.5
Are You on a Diet?	Yes			No
	13.6			86.4
If So, Is It:	Reducing?			Bland?
	62.3			37.7

The average executive eats too fast, doesn't allow enough time for his meals. However, his drinking habits have been vastly misjudged, as indicated in the adjoining table of survey results.

Money Troubles — Dr. Johnson, president of the Life Extension Foundation and medical director of its parent organization, Life Extension Examiners, recalls the case of another patient. This case points out that the post-war period of inflation, with desire to extend and upgrade standards of living, has created hardships for some.

Take Bill, age 38, with two children, a fine education and a good war record. Bill had pushed up to a good salary level—too quickly, perhaps, for that seemed to cause his excess tensions.

Worried "Sick" — He admitted he was worried continually about personal finances, was sick from loss of weight, insomnia and indigestion. He had moved to a house in the suburbs, but even with the seemingly adequate income he earned, he was finding it impossible to keep up with a circle of friends.

"How could he expect his company to have confidence in his handling its affairs when he couldn't handle his own?" This restored Bill's perspective.

"He agreed to re-appraise the situation and, with his wife, 'pull in their horns,' and seek a more realistic level," Dr. Johnson recalls. "Bill's company sent him to us for another annual exam the following year. It was good news to learn he had sought out activities and friends on his own financial plane. How did he feel now? Wonderful!"

Examinations Help—Not all can adjust as easily as Bill, but his story indicates how tensions at home can make a promising executive far

less effective at work, even if his problems don't originate there.

Bill's case also points out the value of regular health examinations. While there was nothing organically wrong with Bill, it uncovered the seeds of his tensions from physical symptoms.

Of the manufacturing group, 88.4 pct, a convincing majority, said they benefited from their last health examination through reassurance of good health.

On the same plus side, 6.3 pct benefited through detection of a correctable ailment, 8.6 pct, although healthy, profited from suggestions for a change of eating, exercise or recreational habit.

How They Relax—In regard to recreation, executives could stand some improvement. A majority exercise infrequently, 36.2 pct on week ends only, and a scant 12.3 pct daily.

They are split about evenly on extra-curricular activities, with only 52.1 pct actively participating. When they do, church activities attract most, 51.8 pct. Next comes civic activities, 43.5 pct; followed by business clubs, 34.9 pct; fraternal, 20.2 pct; youth, 20.7 pct; and others, 26.9 pct. Some, of course, have special interests.

A strong majority, 65.5 pct, have hobbies, with activity confined to week ends for the most part. On the other hand, civic or other activities generally take place on week nights.

At Home Week Ends — Are week ends free for home and family activities? Usually, in 68.9 pct of the cases, always in 23.4 pct. Only a scant 7.7 pct rarely devote their week ends to their family.

The two-week vacation still predominates, with nearly everyone going away from home on the vacation.

Use Tranquilizers—Only 10 pct have difficulty getting to sleep. Of these, 35.3 pct use sedatives. Only 4.7 pct of the manufacturing group regularly rely on tranquilizers to assuage stresses. **(Turn Page)**

How Are Your Tensions?

Everyone experiences occasional tension, usually the result of temporary emotional - upsetting situations. That's par, explains Dr. Johnson.

But when tension occurs frequently, if it is prolonged, or becomes intense, it is time to take constructive, positive action.

Try this simple test. It may help you recognize what's behind your excessive tension. Consider each question in terms of your family, friends, job, and business associates.

	Rarely	Often
Do petty incidents irritate you?	☐	☐
Are you critical of people, things?	☐	☐
Do you feel neglected, left out?	☐	☐
Are you suspicious, distrustful of people?	☐	☐
Do you think you are indispensable?	☐	☐
Are you apprehensive of events to come?	☐	☐
Do you have sleepless nights?	☐	☐
Are you impatient, rush to get things done?	☐	☐
Do you feel you must always be first?	☐	☐
Do you worry about decisions you make?	☐	☐
Are you bored with everyday things?	☐	☐
Is it difficult for you to give credit?	☐	☐

Any you checked "often" need attention. Start working on them now. You'll be surprised with the improvement in your general outlook.

What Causes Excess Tensions?

It's Not So Much the Job, as the Man

The job will create tensions, but generally only in tension-prone individuals.

Personality factors hold the key to most situations where excessive tensions build up.

▪ When excessive tensions do exist, what causes them? Is it the job? Or is it the man himself?

Survey results, as well as medical opinion, indicate that the job is being unjustly accused as creating excessive tensions.

"We should stress that jobs are not tense," suggests Dr. Johnson. "Tensions are more related to the personality of the individual."

How do the overall survey results bear out this contention? Here are some simple indicators:

Little Greater Workload—Three and a half times as many under constant tension say they are working too hard. Five times as many under excess tension say they work under constant pressure.

Yet among these, the incidence of homework is only 8.8 pct more and hours of homework only 9.7 pct more than among those under little or no tension. Business travel, business entertainment and working hours are but a shade greater among those under tensions.

Facts indicate, then, that those who suffer from tensions actually work under very little more pressure than those who shrug off their pressures.

The incidence of tension does vary widely among occupations. No significant pattern, however, could be established on the basis of individual job characteristics such as creativeness, analytical work, personal contact, or multiple responsibilities.

Job Attitude — Attitude toward the job may be one of the greatest contributing factors toward excess tensions of the individual.

Among those who are under constant tension—

Boredom is 355 pct greater.

Job insecurity is 174 pct greater.

Dissatisfaction with business progress is 155 pct greater.

Dislike of business entertainment is 59.2 pct greater.

Aversion to business travel is 44.7 pct greater.

Distaste of business homework is 31.5 pct greater.

Want to Retire — Significantly, 60 pct more of the high tension group would like to retire by age 55.

Dr. Johnson observes that a tense man desperately seeking retirement as a relief from his tensions will most likely be in for a disappointment. Retirement for him may appear to be an escape, but, unless he has learned to more mod-

Fewer Tensions in Manufacturing

▪ The manufacturing executive, all in all, is less subject to excess tensions than the overall executive group. (See table, opposite.)

While executives in the entire group average 13.3 pct working under constant tension, 12.5 pct in the manufacturing group admit to working under the same tension.

It's Consistent—True, this is a moderate differential. But down the entire list, executives in the manufacturing group show a definite tendency to run their lives, and business, in a manner that creates fewer tensions.

This is attributed to two factors: The man himself and the type of work he does.

Job Attracts the Man—There is no doubt but that the job attracts the man to a great extent. At the same time, many manufacturing executives would contend vocally that their jobs are as pressure-building as others.

But the work of a manufacturing executive is more stable, and, more important, less subject to forces that are not within his control.

The advertising executive, for example, has many intangibles such as one man's opinion or whim, individual judgment, and a less definite scale for measuring results.

Sees Results—The average manufacturing executive can see the results of his work, has production or efficiency records to point to. He is less subject to the element of suspense in his job.

His job involves less short term activity and daily fluctuations. He operates on a pre-planned schedule and though he must jump into the breach occasionally, the crises are, for the most part, fewer and farther between.

erately accept other conditions of life, such as his job, there is a strong likelihood that he will be unable to adjust to retirement.

Can't Get Along — On every count, dissatisfaction with the job and its demands on the individual is significantly greater among businessmen under excessive tensions.

And a man who can't get along with others is apt to be susceptible to tensions, too.

The survey reports that dislike of someone with whom they work is 98.7 pct more prevalent among those under constant tension.

Suspicion that they are not receiving fair credit for their efforts is 206.8 pct greater among the constantly tense group. And fear of self-expression is 633 pct more frequent.

Lessen with Age—In regard to age, constant tension is highest in the 30 to 35 age group. Tensions tend to decrease as the man gets older, as he gets more experience and a better job. Things that worry a man at 35 are taken in stride at 50.

Poor Habits — As for living habits, they are poorer among businessmen under excessive tension than among those with few or no tensions, the survey indicates. For example:

Eating breakfast on the fly is 67 pct more frequent; 86 pct more throw down their lunch; 21 pct more hurry their dinner and one out of three is on a diet, nursing gastric disorders.

In recreation:

47 pct fewer get some form of regular exercise.

20 pct fewer have extra-curricular interests.

18 pct more have no hobby at all, and

1 out of five gets no recreation whatsoever.

In this same high-tension group, 46 pct more average six hours or less sleep at night and 139 pct more rarely have week-ends free for the family. Vacation time is 20 pct less than the survey average.

Tranquilizer drugs are taken by 165 pct more of the tension group and 150 pct more use sleep-inducing sedatives.

Worries Contribute — Personal worries are heavy contributors to tensions. Seven of every 10 men under constant tension report some significant personal problem.

Comparing their worries with the rest of the group, 175 pct more have office problems, 133 pct more worry about health. More are concerned about finances, yet, as a group, their income is above the average for all 6000 respondents.

Summing Up — Conclusion as reported by the survey:

"Based on the replies of the 13.3 pct group who reported constant tension, tension is not caused by age, occupation, or job demands.

"But in light of their response to questions concerning their attitudes toward job, associates, and personal conditions, tension is clearly identified with the personality of the individual executive and stems from within the man rather than from the outer forces of his living or working environment."

In other words, tensions are not caused so much by the job as by the man himself. **(Turn Page)**

How Manufacturing Executive Tensions Compare with All Business

Pct of Replies	Manufacturing Executives	Survey Total	Per Cent Increase, Decrease
Working Under Constant Tension	12.5	13.3	— 6.0
Work Requirements			
Homework once or more a week	28.6	30.0	— 4.7
Over 5 hours a week	24.7	25.8	— 4.3
Entertainment			
More than 2 business lunches a week	16.2	19.9	—18.6
More than 1 evening business date	8.0	11.0	—27.3
Attitude Toward Work			
Bored with job	1.3	1.3	....
Loathe homework	19.0	20.5	— 7.3
Dislike business entertainment	28.6	25.3	+13.0
Attitude Toward Associates			
Dislike someone with whom they work	16.3	18.2	—10.4
Cannot express self (to superior)	0.9	1.1	—18.2
Tension due to superiors	25.7	25.4	— 1.2
Incentive			
Feel insecure in job	13.7	14.3	— 4.2
Dissatisfied with progress	6.1	6.5	— 6.2
Feel lack of recognition	6.3	6.2	+ 1.6
Worries			
Personal health	16.5	17.9	— 7.8
Office problems	24.6	25.9	— 5.0
Personal finances	17.7	20.6	—14.1
Home problems	13.3	14.2	— 6.3

How to Deal With Your Tensions

Follow These Positive Steps

Dr. Harry J. Johnson has been medical director of Life Extension Examiners for 25 years. He formerly served as assistant professor of clinical medicine.

His work has brought him wide knowledge of the health problem of businessmen and the adjustments they must make during their business lives.

These are Dr. Johnson's personal recommendations.

▪ You can't cure tension, but it can be modified.

Recognize that jobs aren't tense, people are. Abnormally tense people are not neurotics or psychopaths, simply persons more susceptible to tension precipitating factors.

Help Yourself—Excessive stress does not spell disaster, but it does require attention, your attention. If you are tense, it is you, nothing else. Only you can take these positive steps to reduce your tension.

Change your perspective—

When molehills become mountains, rationalize. How important will that irritating situation be tomorrow? Is that worry really worth so much of your time? How necessary is it for you to always beat out the other fellow?

Make the Most—Build up your self confidence:

When you get that "Milquetoast" feeling, remember to make the most of what you have. Don't fret about your "have nots." Anticipate the best, not the worst.

Be tolerant:

When someone rubs you the wrong way, ask yourself: What wrong has he really done me? (Probably none.) What has he done for me that's nice? (Something, surely.) What reason have I to criticize him so? (Jealousy, usually.)

Be Moderate—When you become impetuous, impatient, analyze: Who loses by this constant rushing, restlessness? (Only you!) Is there so much urgency that another hour, another day would matter? Can't I learn to accept the world as it is, not as I'd like it to be?

Check Your Health — Because mental and physical health are so intimately related and interdependent—

Look at your living habits:

They may be the real cause of your tension. Are you getting enough exercise, recreation? (Physical activity is stimulating.)

Is your nightly sleep adequate? (Fatigue is a prime cause of tension.)

Do you eat balanced meals, take enough time for eating? (Nutritional deficiencies, gastric disorders can produce stress, too.)

Check up on your health:

Good health is your best defense against tension. Know that your health is good, or find out how you can improve it. Have a health examination every year.

DR. JOHNSON: Work itself does not cause excess tensions.

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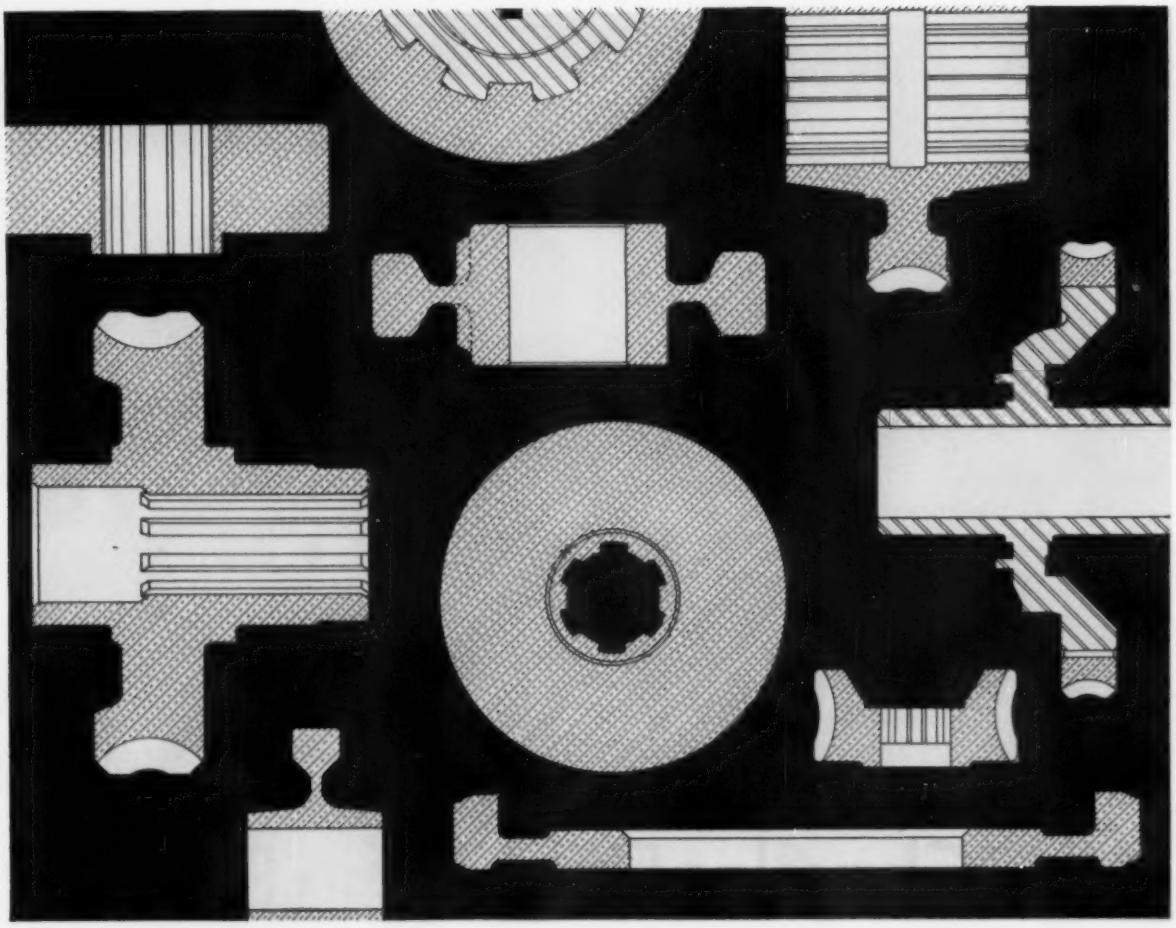

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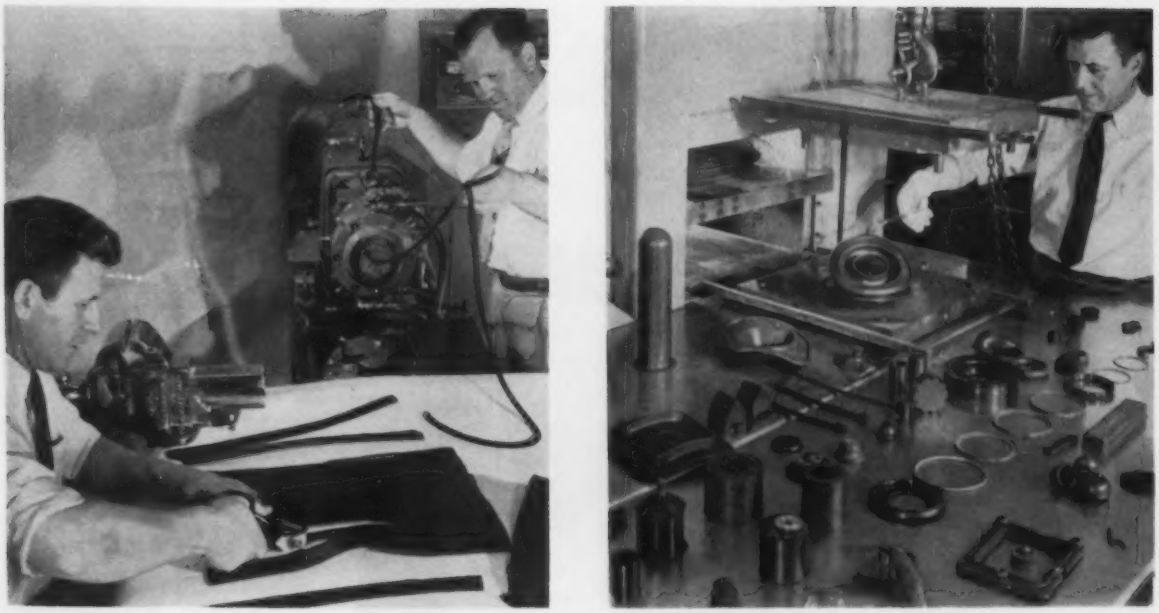

SPEED COUNTS: Chrysler engineers mix, roll (left), and mold (right) experimental rubber parts for testing.

Why Chrysler Dabbles in Rubber

Chrysler uses research labs of the rubber industry for development work.

But when the automaker is in a hurry to test a new part, it makes it in its own pint-sized rubber plant.

The entire operation is in one room.—By H. R. Neal.

▪ A room-size rubber industry, complete with practically everything except rubber trees, facilitates design and testing of rubber auto parts at Chrysler Corp., Detroit.

A small 30 ft by 35 ft room at the Engineering Div. contains the whole operation from blending to milling. The little "industry" does a pretty big business, according to W. J. Simpson, managing engineer of Chrysler's organic materials laboratory.

Why, with the extensive research facilities of the rubber industry at its disposal, does an auto company want its own lab?

Lab's Job — "Having our own equipment makes it possible to turn out experimental parts anywhere from a week to three months faster than if we had to obtain them from an outside source," Mr. Simpson said. "Our tiny but powerful rubber mill enables engineers and technicians to transform various blends of natural crude rubber and new man-made materials into parts for experimental testing in less than two hours."

However, he said, Chrysler only supplements work done by some 180 companies that supply rubber parts.

Pilot Size—An indication of the size of the operation is the size of the equipment. An internal-type rubber mixing machine is only about 1/100th the size of a production machine. The mill is about one-tenth the size of regular mills. An extrusion machine is one-sixth the size of those used by the rubber industry.

But the size of the equipment doesn't tell the number and types of parts that can be produced in the laboratory. These include brake pedal pads, engine mounting cushions, transmission seals, body bumpers and drive shaft insulators. In all, some 15,000 experimental rubber parts are produced for testing each year.

Materials are mixed according to thousands of formulas, many revised repeatedly, according to Mr. Simpson. These are aimed at determining combinations that make rubber parts resistant to oils, solvents, low temperatures and abrasion.

The Process — Durability is

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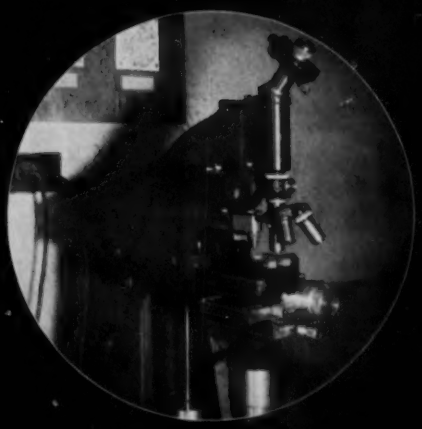

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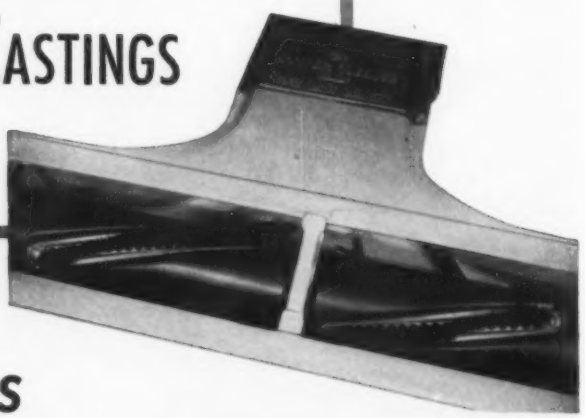

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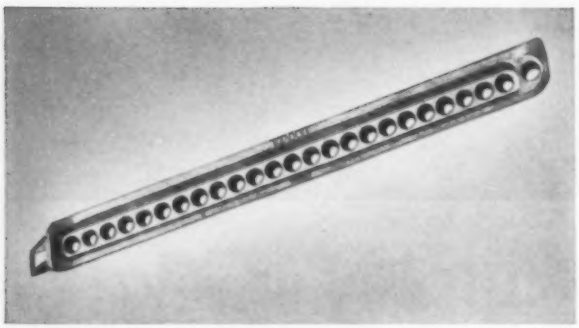

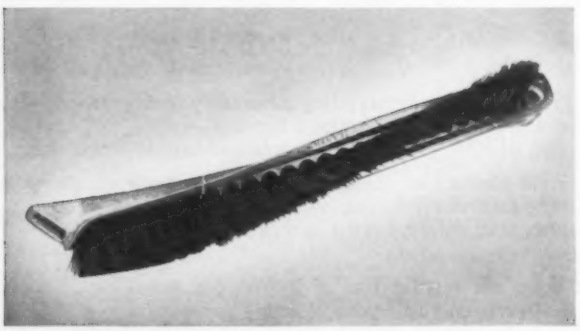

The straight die casting (at top) is put into production without any machining. The bristles are fastened in place and the forming operation twists the bar to the proper curvature for installation on the agitator.

Design engineers at The Hoover Company found that DUCTILITY provided the necessary answer to their problem of using ZINC Die Castings in the agitator of the upright electric vacuum cleaner.

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WEEK ENDING	CARS	TRUCKS
March 7, 1958	84,202	18,240
March 1, 1958	91,508	17,451
March 2, 1957	140,362	21,743
March 8, 1957	14,061	18,835
TO DATE 1958	966,388	174,161
TO DATE 1957	1,381,600	211,036

*Preliminary Source: Ward's Reports

achieved by mixing crude rubber with reinforcing agents. Resistance to aging and weather conditions is obtained by adding anti-oxidants. Some parts get coloring agents. The laboratory's mill flattens the rubber between rollers to about one-quarter of an in. The thin rubber sheets are cut to the desired size, placed in molds or dies and vulcanized.

One vulcanizing method employs a steam chamber where temperatures are held as high as 325°F for as long as 45 min. Another uses a hydraulic press applying to 236 tons of pressure on a single mold.

For Testing—Mr. Simpson said the entire operation, from mixing to molding, takes less than two hours. Finished parts are then distributed to other engineering departments for analysis, testing and approval before they are installed on test cars.

Output Sags for All But Rambler, Chevy

Only Rambler and Chevrolet increased February production over the same month last year. These two are also the only cars to show an overall increase for the first two months of 1958 compared with a year ago.

Production of passenger cars plummeted to 392,112 units last month. In January, 489,357 were built. In February 1957 car output totaled 570,650. In the first two months of this year the industry has seen production drop to 881,469 units, 330,413 units or 27.3 pct below the 1,211,882 cars produced in the same period last year.

Sharpest Drop—Hardest hit by the decline has been Chrysler Corp., with production off nearly 60 pct from a year ago. February production of 42,314 units brought the two months this year to 102,241 passenger cars. In February 1957 alone, the firm produced 123,884 units and was just short of the quarter-million mark for Jan.-Feb. with 248,142 cars.

Short Week — Studebaker-Packard has worked alternate weeks since the beginning of the year, some work weeks reduced to four days. Production for February was 2210 Studebakers, 376 Packards. Two month totals are 4409 and 804 units respectively. A year ago February figures were 4665 Studebakers and 1193 Packards for a total of 12,054 units in last year's first months, compared with 5213 this year—a 55 pct drop.

Ford Motor Co. output trails last year by 32.5 pct. Its divisions produced 111,549 cars in February, bringing 1958 output to 247,175 units. This includes 1103 Edsel's built in February and 2836 for the two months. A year ago the totals were 168,674 and 365,250; no Edsel's included.

Off Only Slightly—Of the Big Three, General Motors' has shown the least drop, about 13.5 pct. GM divisions built 220,791 units last month, compared with 263,646 a year ago. Two month totals are 495,657 for 1958 and 571,835 in 1957. Chevrolet production in February was 124,923 units, 286 cars ahead of 1957. So far, this division has exceeded last year's production totals by 323 units with a Jan.-Feb. output of 276,741 units. Another surprise is Oldsmobile. A historic trailer of Buick, it has forged ahead of it and Plymouth. However, production is still well below 1957.

American Motors has been rambling along on Rambler, finds its 31,183 units for the year good for seventh spot in the industry. February output was 14,852 units, up from 7708 the same month last year and the 1957 two-month total of 14,601. The last figure includes 1152 Nash and Hudson cars, now discontinued.

THE BULL OF THE WOODS

WHEN YOU SEE A GUY FEEL HIS POCKETS, T'BE SURE HE'S GOT EVERYTHING, AN' LOOK AROUND T'SEE WHERE TH' BOSS IS, IT DON'T TAKE NO SHERLOCK HOLMES TO TELL HE'S GETTIN' READY T'SLIP OUT TO TH' COAL HOUSE FER A SMOKE-- DOES IT?
NO, BUT IT'D TAKE MORE THAN A SHERLOCK HOLMES T'DOPE OUT WHAT A GUY, WORKIN' IN SO MUCH SMOKE, WANTS WID ANY MORE SMOKE!
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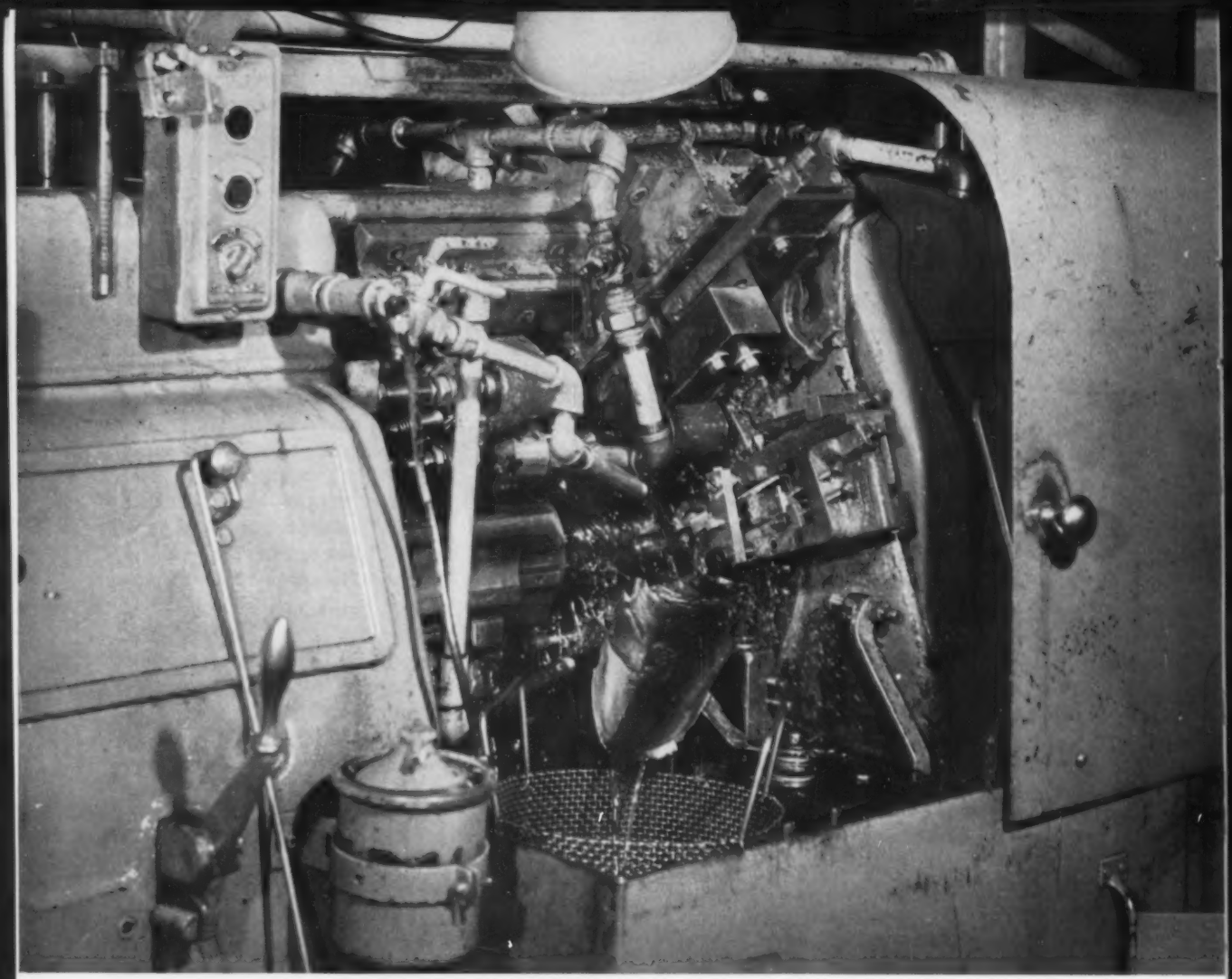

Here's how Transultex reduces automatic screw machining costs

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Good Tax Cut Bet: A Flat $50

But Some Doubt Its Appeal to the Voters

There are two sides to the prospect of a flat-sum tax reduction this year.

Revenue loss would be high, and it's doubtful if it would be reflected in voter gratitude next fall.—By G. H. Baker.

▪ Tax reduction—if it comes this year—is likely to take the form of flat-sum reductions for individual taxpayers. A cut of $50 per person is the figure most discussed in congressional taxwriting circles.

The Treasury Dept. is openly dismayed by this approach to tax reduction. T-men point out that the loss of revenue to the government would add up to nearly $3.5 billion. And a tax cut for $50, spread out over a year's pay periods, would seem like chicken-feed to the individual taxpayers, it is pointed out.

$1 a Week—Thus, workers paid every two weeks would notice a gain of only about $2 in each pay check—hardly enough to generate much gratitude for the politicians who hollered the reduction through Congress. But these individual cuts all add up to several billions. After all, $3.5 billion will buy some badly-needed national defense—rockets, missiles, and the related hardware needed to sustain jet-age defense.

There's little talk in Congress of voting any reduction in the existing tax rate of 52 pct on corporation income. (The politicians say frankly that incorporated business just doesn't have the political sex appeal that individual voters have, and if there's to be any tax-cut bill at all, it's the individual who is to be favored.)

No Automatic Vote Getter—Note: Republicans in Congress learned in 1948 that tax cuts for individuals, if confined to only token amounts, don't necessarily win voter support. In fact, they can result in voter contempt.

Highway Program May Get Push

There's a better-than-even chance that the national highway program will be souped up by Congress this year. It's been lagging badly. Congress and the White House are determined to get it rolling so as to provide employment and to get some orders placed with mills for steel, cement, and other roadbuilding materials.

Trouble is partly money, partly inefficiency on part of state governments in acquiring land and letting contracts. Money troubles arise from downtrend in user taxes (gas, oil, trucks, buses).

Congress now find it was too optimistic in estimating revenues. So there's clamor to scrap the pay-as-you-go provision of the highway law, and to permit deficit financing of the new roads. Law may be rewritten to permit road officials to dip into general tax revenues to augment their sagging "take" from user taxes.

"Buy American" Urged in Foreign Aid

Anti-Recession Plan — There's new talk in the Senate of writing "buy American" clauses into foreign aid programs in order to combat the recession here at home.

Sen. Knowland, R., Calif., says he'll push for such a provision in all purchase orders issued by the government's foreign aid officials. This includes military aid as well as nonmilitary aid.

Foreign aid chiefs are reluctant to tell how much they buy overseas. Military men say they've been letting about $55 million worth of procurement contracts abroad each year.

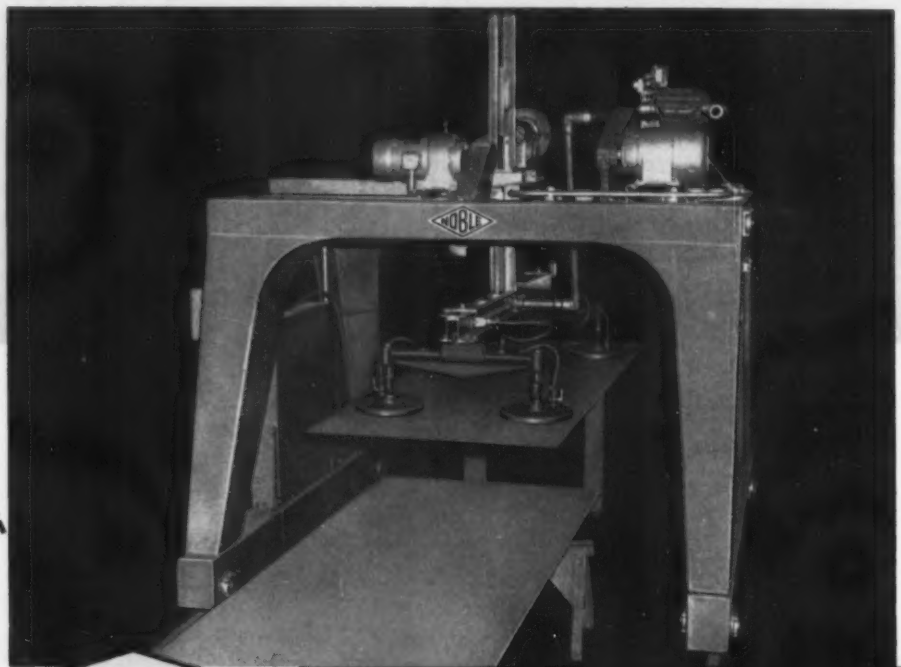
Lowest Bidder? — But at the State Dept., foreign aid chiefs say they can't tell the value of procurement contracts they let abroad because they don't keep their books that way. They claim they let contracts to the lowest bidders—regardless of whether the bidders are located here or abroad. But it's pointed out that this means many contracts have been let abroad, because of the lower wage costs and other lower production costs prevailing in foreign countries.

Up to $700 Million—Unofficially, it's estimated that about $700 million worth of procurement contracts are being let to foreign suppliers this year. This is in addition to the $55 million in military procurement contracts being let abroad.

Practice of buying abroad started 10 years ago when U. S. factories were running at or near capacity. Foreign industrial centers were crying for business. Today, this situation is largely reversed.

PROCESSING PLATE?

Get the production you're paying for



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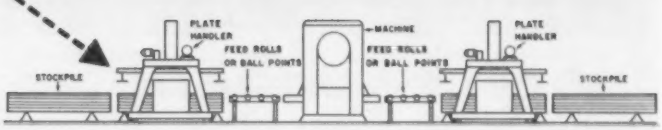

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San Bernardino Wants Industry

County Offers Specially Set Aside Zones

The welcome mat is out for heavy industry in San Bernardino County.

Area's advantages include nearness to growing markets, good climate and living conditions.—By R. R. Kay.

▪ San Bernardino County, some 50 miles east of Los Angeles, is making a strong bid for industrial development.

The area has lots of room to offer for new plant sites. The county's size equals New Jersey, Delaware, Massachusetts, and Rhode Island put together.

Right now the county is offering 35 sq mi of industrially-zoned property. And there's no restriction on the size or type of manufacturing. In fact, there's a real big welcome mat out for heavy industry. Hazardous, noisy, or odorous operations will find a home in specially set aside zones.

Many Advantages—The county claims these attractions for metalworking plants:

Fast-growing nearby markets. Los Angeles and San Diego are close by. And it's only an overnight haul to the San Francisco Bay Area and the larger cities in Arizona and Nevada.

Kaiser Steel Corp. The West Coast's only integrated steel mill is in the heart of the county's industrial zone. The company is rounding out a $194 million expansion program.

Missiles, aircraft, and electronic industries. These segments of metalworking are busy in nearby Los Angeles. A good many parts and components makers already have their roots in San Bernardino County.

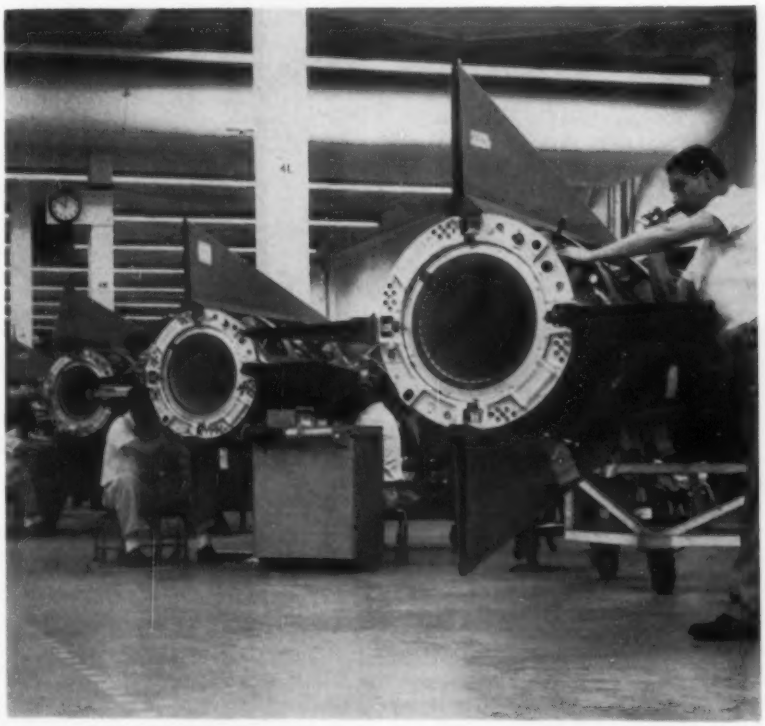
Plentiful Minerals—Dry climate. This is a boon to makers of precision parts, instruments, and many delicate systems that are important in the missiles program. In addition, the dry weather permits outdoor storage for many metal products.

Minerals. The county produces 45 minerals—from antimony to zinc. Cement, limestone, and salines are big. Several large firms are busy supplying minerals for the exotic fuels, the high-powered superfuels of the jet and space age.

Facts Available — Arthur B. Groos, Director of Industry, County Board of Trade, San Bernardino, Calif., says he has some revealing facts on the area. He'll be glad to send them to anyone interested.

The living is nice, too. California-style houses blossom out in places like Hesperia, Apple Valley, Twentynine Palms.

First with the Troops Overseas



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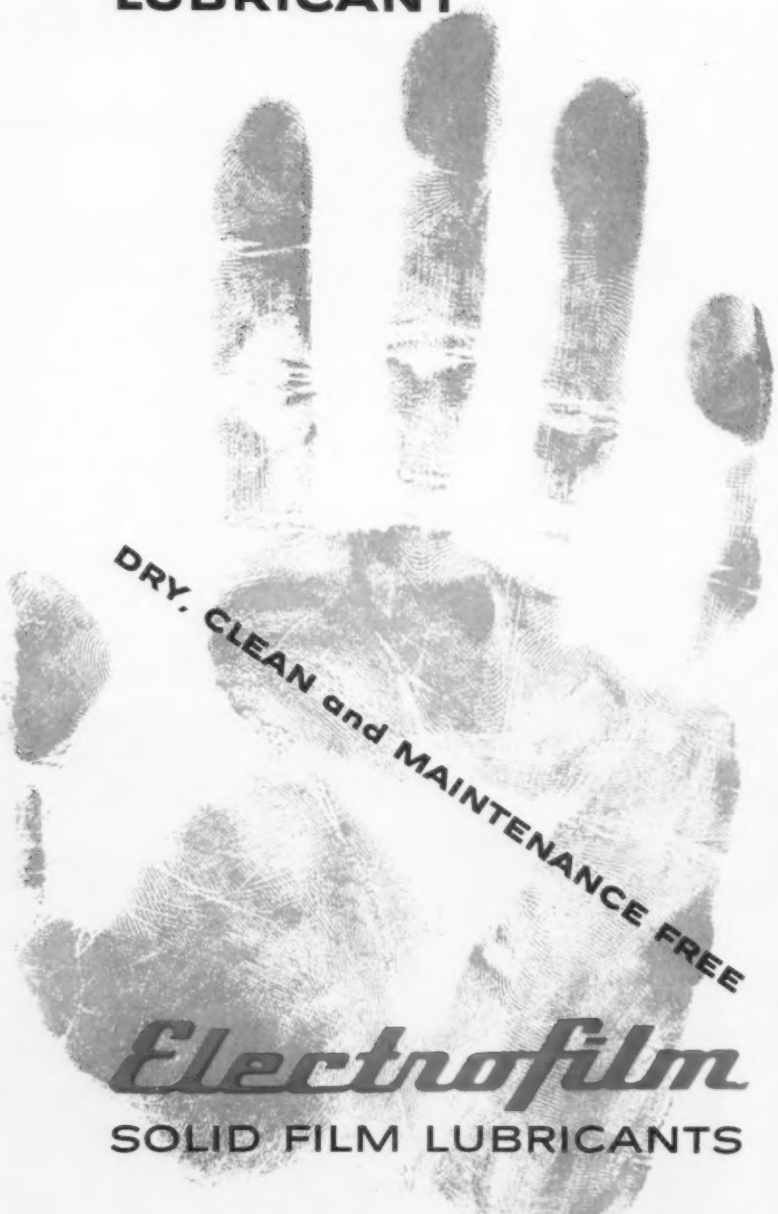

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U. S. Machines Going Patriotic

Red, White, and Blue Nameplate Goes to Work

American Machine Tool Distributors' Assn. wants greater recognition given U. S. tools and their manufacturers.

They're launching drive to have members put nameplate on units which they sell and install. —By E. J. Egan, Jr.

▪ Machine tool gray will never win any prizes for being the liveliest color of this or any other year. It's just been a good serviceable shade for a long time now, and most people have been content to let it go at that.

But little touches of red, white, and blue are apt to appear on the new American-made tools you'll buy in the future. Especially if you buy them from a member firm of the American Machine Tool Distributers' Assn.

Sign of the Eagle—AMTDA is launching its new machine tool nameplate program this week in conjunction with its 34th Spring Meeting in New Orleans. The object is to have members affix a 3 x 6 in. metal nameplate to every U. S. built machine they sell and install.

Each red, white and blue plate features the American eagle, the AMTDA's own emblem, and the words, "Made in America . . . Sold by a Member of American Machine Tool Distributors' Association."

Object of the nameplate program is to achieve greater recognition both for American machine tools as being the "master tools of industry," and for the Americans who build and sell these tools.

Global View Coming

Members of the National Machine Tool Builders' Assn. will take a long look next month at the global picture for their industry. The theme of their 56th Spring Meeting, to be held at Chicago's Edgewater Beach Hotel on April 24 and 25, is: "World Trade and Machine Tools."

Authorities from within and without the industry will speak on a wide range of subjects, including: (1) the policies and effects of the U. S. world trade program, (2) the German machine tool industry, (3) the British machine tool industry, (4) reasons for, and experiences in locating U. S. machine tool production facilities abroad.

Good Finish, No Grind

▪ Floor-to-floor time of 14.6 minutes is all it takes to rough and finish turn precision pump shafts at German-Rupp Co., Mansfield, O. Five separate step diameters are turned within ±0.002 in. on each SAE 1045 cold-rolled bar. Grinding of the finish turned bearing surfaces is unnecessary.

Quantity production is achieved on a 16-in. Monarch air-gage tracer lathe, using single-point carbide tools. For fast handling of workpieces, the lathe has an air-operated chuck and tailstock.

INDUSTRIAL BRIEFS

New Horizons — Hanson - Van Winkle - Munning Co., Matawan, N. J., is reorganizing its engineering division. Emphasis will be placed on development of new and improved methods in the anodizing and electroplating fields. Increased research of new products and equipment is planned. The company is building new mechanical and laboratory facilities and expanding facilities of its electrochemical laboratory.

Ohio Operation — The Singer Steel Co., Cleveland, will distribute Revere aluminum products for the Ohio district. New unit will be operated independently as the Singer Aluminum Co. It will be integrated with the parent organization for the warehousing of comprehensive inventory of the Revere metal, and for sales, service and administration.

Big Job for L&N—The Columbia-Geneva Steel Div., U. S. Steel Corp., has awarded contracts to Leeds & Northrup Co., Philadelphia, for openhearth furnace controls. The controls will be used to improve the fuel efficiency of ten furnaces used in making steel by the openhearth process at Geneva Works. It will also similarly equip furnaces at the Pittsburg, Calif., plant.

"You people sure you understand how to use this equipment?"

Milwaukee Outpost — Adamas Carbide Corp., Kenilworth, N. J., has appointed Cutting Tools, Inc., Milwaukee, as an authorized Adamas distributor. Adamas Carbide Corp. manufactures a complete line of tungsten carbide tools, tool tips, dies, wear parts, and Dex-A-Tool, Adamas' toolholder for throwaway inserts.

San Diego Service—The Yale & Towne Mfg. Co. has established a factory branch for the sale and service of industrial lift trucks in San Diego, Calif. Operating under the direction of the Yale Branch in Los Angeles, the San Diego facility is located at 6055 Fairmount Extension. It has been set up to cover San Diego and Imperial counties.

Start the Count-Down—Norris-Thermador Corp., Los Angeles, is enlarging facilities at its Vernon Plant for manufacture of large missile motor chambers. A $650,000 expansion program is being completed with principal expenditure having been made for special equipment for rolling, welding, machining and heat treating alloy steels. The company has produced a quantity of rocket motor assemblies for the Navy's surface-to-underwater missile, the RAT (rocket assisted torpedo).

Squeeze Is Off Toothpaste Market—K. M. Leghorn, president, Sun Tube Corp., predicted that pressure cans will capture 10 pct of the toothpaste market this year. It should account for nearly one-quarter of all toothpaste packages sold in 1959. Three brands of aerosol toothpaste are now being marketed on a limited basis. The pushbutton containers use a nitrogen propellant to dispense the paste. Sun Tube has developed and marketed an aerosol valve for toothpaste, foods and other viscous products, and is a subsidiary of American Can Co.

Refinery Contract—The M. W. Kellogg Co. has a contract for design, procurement and construction of Kennecott Refining Corp.'s new Electrolytic Copper Refinery near Baltimore, Md. The new refinery will have a capacity of 16,500 tons per month treating impure metal at 99.4 pct copper and increasing its purity to 99.95 pct. Engineering design for the new plant is under way.

Ready for Research — Stoner-Mudge Co., Pittsburgh, has completed its Research and Development Center. The Center is housed in a new 3-story addition to the company's north side headquarters building. Stoner-Mudge, a division of American-Marietta Co., is one of the leading producers of protective coatings for the container industry.

United They Stand—Two divisions of Parker-Hannifin Corp., specializing in the manufacture and sale of rubber and metal seals for fluid systems, will be united in a single major organization. Name of the new division, combining present operations of Parker Rubber Div. and the Franklin C. Wolfe Div., will be Parker Seal Co., Div. of Parker-Hannifin Corp. Administrative headquarters for the division will be in Culver City, Calif.

Everybody Benefits—An allocation of over $67,000 for gifts in 1958 for national and local educational, health and welfare organizations has been voted by the Kiftmullen Memorial Foundation of Lehigh Structural Steel Co., Allentown, Pa. This figure represents the highest amount granted in any year so far. The 1958 contributions bring to a total of $442,000 the amount the Foundation has granted since its establishment in 1949.

Nuclear Testing—The Babcock & Wilcox Co. plans to expand its critical experiment laboratory to include a 10 kw "pool-type" test nuclear reactor in Lynchburg, Va. The unit will be used to conduct experiments involving nuclear fission at elevated temperatures. It will be used to test the products of B&W's nearby fuel element plant. Completion is scheduled for July 1.

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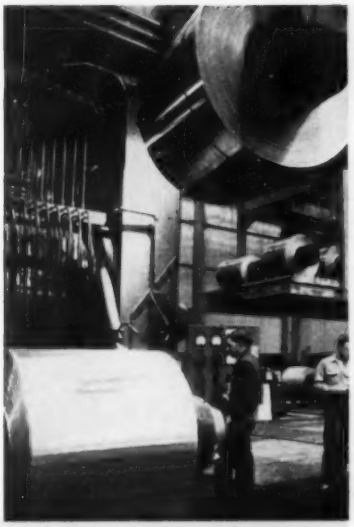

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J. J. Lincoln, Jr., appointed president, Pure Carbonic Co., New York, Div. of Air Reduction Co., Inc.; **E. R. Lawrence,** becomes chairman, Pure Carbonic Div.

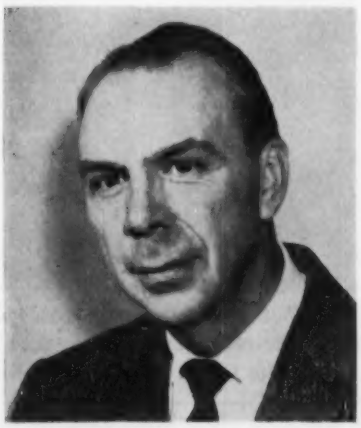
D. H. Montville, appointed vice president, sales, Shartle Div., The Black-Clawson Co., Middletown, Ohio.

P. W. Christensen, Sr., elected treasurer and chairman of the board, Cincinnati Gear Co., Cincinnati.

R. C. Wright, elected vice president, Iron Fireman Mfg. Co., Cleveland; **Jack Jordan,** appointed asst. to the president.

Frank Miles, appointed vice president, Sales Divisions, The Garrett Corp.

Norvon Clark, appointed vice president The H. K. Ferguson Co., Cleveland.



R. E. Brackett, appointed asst. sales manager, The L. S. Starrett Co., Athol, Mass.

P. W. Christensen, Jr., elected president, Cincinnati Gear Co., Cincinnati.

M. L. Zalk, elected vice president, Hyman-Michaels Co., Chicago.

H. W. Garrett, elected vice president, U. S. Industries, Inc., Longview, Tex.; **Taylor Milton,** elected president, Garrett Oil Tools Div.

D. E. Harrison, appointed vice president and general manager, Midwestern Div., True-Trace Sales Corp.

C. B. Vernooy, appointed vice president, accounting, U. S. Steel Corp., Pittsburgh.

R. J. Mills, appointed general sales manager, American Hoist & Derrick Co., St. Paul, Minn.

C. R. Carmen, elected asst. vice president, L. B. Foster Co., New York.

J. E. Hardesty, elected vice president and treasurer, The Black & Decker Mfg. Co., Towson, Md.

A. E. Reinhard, elected vice president, basic steel making plant, Portsmouth, O., Detroit Steel Corp.

B. D. Booth, named general sales manager, John W. Hobbs Corp., Div. of Stewart - Warner Corp., Springfield, Ill.

A. G. Massey, named product manager, Curtiss - Wright Corp., Cleveland; **L. J. Moulton,** named staff application engineer.

R. E. Hoover, appointed executive vice president, The Standard Tube Co., Detroit.

R. H. White, appointed superintendent, coke-coal chemical and blast furnace div., Fairless Works, U. S. Steel Corp., Morrisville, Pa.

R. J. Stanton, appointed asst. superintendent, labor relations, Indiana Harbor Works, E. Chicago, Ind., Inland Steel Co.

J. C. Arntzen and **G. W. Schlutius,** elected executive vice president; **R. A. Simonsen,** plant manager; **A. O. Muehlenbrock,** St. Louis plant manager; **F. P. Haas,**

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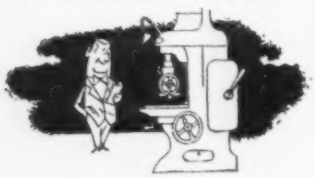

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contracting manager; and **R. M. Boydstun,** St. Louis contracting manager.

W. M. Kirkpatrick, appointed western general counsel, The Anaconda Co., Butte, Mont.

A. J. Thoma, elected vice president and controller, Air Reduction Co., Inc., New York.

Oswald Tower, Jr., appointed sales manager, Michigan Seamless Tube Co., S. Lyon, Mich.

C. F. VanRaaphorst, named manager, Norwalk, Conn., plant, Bridgeport Brass Co., Bridgeport, Conn.

R. C. Hessinger, appointed metallurgical engineer, Powder Metallurgy Dept., Vanadium-Alloys Steel Co., Latrobe, Pa.

C. S. Yrene, appointed asst. engineer, compressor engineering, Allis-Chalmers West Allis Manufacturing plant.

J. R. Tinelli, appointed area representative, Long Island and metropolitan New York territory, The American Screw Co., Willimantic, Conn.

E. H. Koontz, named central west regional sales manager, Reliance Electric & Enginering Co.; **H. A. Latta,** named district manager, Pittsburgh.

Roy Prochnow, appointed asst. to director, operations, Clearing Machine Corp., Div. of U. S. Industries, Inc.

W. J. Jenkins, named northeastern representative, Bucket Div., Erie Strayer Co.

B. P. Doty, Jr., named manager, sales, Cleveland district sales office, U. S. Steel Corp.

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5 WAYS

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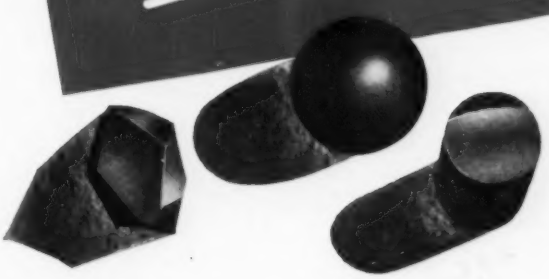

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E. J. Udick, named manager, Sheet Mill Dept., Weirton Steel Co., Div. of National Steel Corp., Weirton, W. Va.

Paul Des Jardins, appointed manager, Product and Marketing Dept., Worthington Corp., Harrison, N. J.

William McNeil, appointed New York district sales manager, Jones Machinery Div., Hewitt - Robins, Inc., Stamford, Conn.

W. F. Simmons, appointed chief, High-Temperature Metals Research Div., Battelle Memorial Institute, Columbus, O.

R. S. Root, appointed chief engineer, Clutch Div. and Machine Tool Div., Lipe-Rollway Corp., Syracuse, N. Y.

J. R. Carroll, appointed district sales representative, Georgia sales district, Connors Steel Div., H. K. Porter Co., Inc., Birmingham, Ala.

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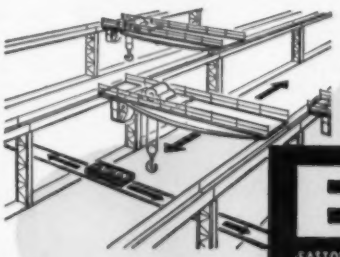

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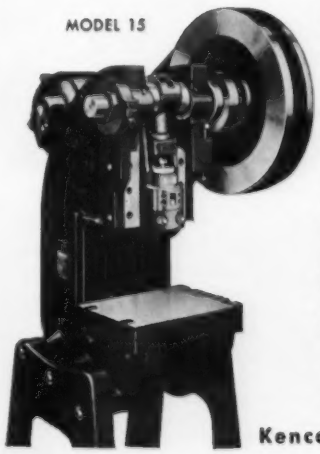

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Tight Bolts Stop Fatigue Failures

By Robert Sproat—
Chief Metallurgist,
Standard Pressed Steel Co.,
Jenkintown, Pa.

Why buy a high-tensile bolt if you're only going to tighten it to take a 5000 lb load?

A little vibration and a few overload cycles can shake and rattle it into a costly—maybe dangerous—fatigue failure.

All the tightening they can stand is what makes fastenings stay put—and safe.

▪ Industry's failure to pull up good and tight on screws and bolts — and then keep them that way— causes more than 75 pct of all threaded-fastener failures.

Neglecting either to apply or maintain enough of a preload leaves fasteners wide open to early fatigue failure, and at levels far below their theoretical static-load strength. Unquestionably, fatigue is the number one enemy of any fastener exposed to even mild dynamic loading. And most joints, even so-called "pure-static" connections, are subject to some degree of fatigue stress.

Of course, a sound fastener and proper design are musts. But even with these, poor application techniques lead to fatigue failures. Such failures are costing industry and its customers untold millions of dollars.

One Simple Rule—Most of this waste can be prevented, and maximum use of inherent bolt strength obtained, by observing one simple rule: Tighten bolts beyond their working loads and then keep them tight. For if the preload you apply and maintain is greater than any service load the fastener will encounter, there can be no fatigue failure. You need only fear that part of a working load which may exceed the preload.

But how tight should you tighten a screw or bolt? The ideal point is

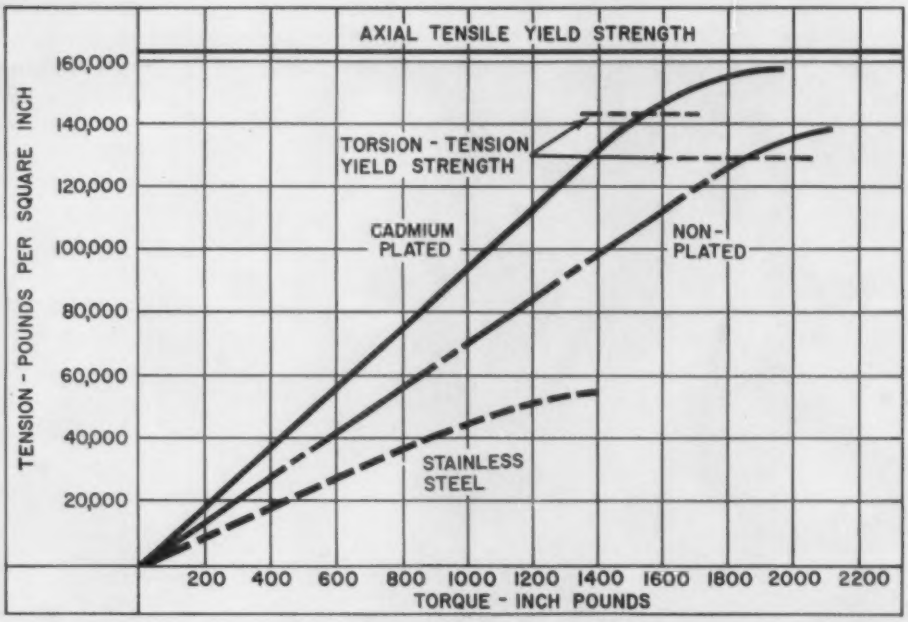


FIG. 1: Torque-tension curves show that plating (or lubrication) boosts yield strength and preload.

just below the yield strength. This provides a cushion for working-load variations. More importantly, it prevents loosening and loss of preload—the more you tighten a threaded fastener, the tighter it stays.

How closely can you approach yield strength? It depends on the fastener material and the tightening technique. Some tolerance must be allowed for inevitable variations and tightening scatter. About 65 pct of yield strength is a good goal for conventional torque-wrench tightening. You can aim at 80 pct or more of yield strength if you use more precise methods to measure induced load.

Different Yield—But remember this: Torsion-tension yield strength (which is what bolt tightening involves) is always less than yield strength in straight tension. The tension component of torsion-tension yield strength may be anywhere from 50 pct or less to 90 pct or more of yield strength in pure tension.

The difference is a function of friction between mating threads and depends on material and lubrication. The 50-pct-or-less figure would apply to a completely dry and rough cut thread; a value of 90 pct or more would apply to a well lubricated alloy steel screw.

The safest way to approach the tightness limit is to have a torque-tension curve (like any of the three shown in Fig. 1) for the joint in question.

Fig. 1 compares the "tightenability" of plated and nonplated (dry) assemblies of the same grade of alloy steel. It also matches these two with a dry threaded fastening of stainless steel.

Lubricant Helps—Note that the cadmium plating (which acts as a lubricant) is an aid to tightening and that stainless steel sliding against itself has a high coefficient of friction. Higher lubricity also reduces the amount of variation in successive tightenings. Surprisingly, however, use of a lubricant does not increase the tendency for a joint to loosen in anywhere near the same proportion that it aids tightenability.

If it is not practical to torque-tension test an assembly in advance, you can apply an empirical equation that works fairly well: $T = F \times D \times L$, where T is torque in in.lb, D is nominal thread diameter in in., L is load in lb, and F is a surface finish factor. Typical values for F are listed in an accompanying table.

There are a number of ways to measure the preload induced by tightening. Some are very accurate. However, the most widely used technique measures and controls the applied torque. Standard devices which do this are manual torque wrenches and the preset-friction tools used on assembly lines.

Friction Affects Results — A major shortcoming with such tools is the inherent scatter in results due to friction—a variable affected not only by surface finish, but by dirt, grime, oil and even atmospheric changes. The wrenches may be accurate to ±2 pct, but scatter may produce errors of 30 pct or more.

For want of any torque measuring device at all, assume that the average man can pull 100 lb at

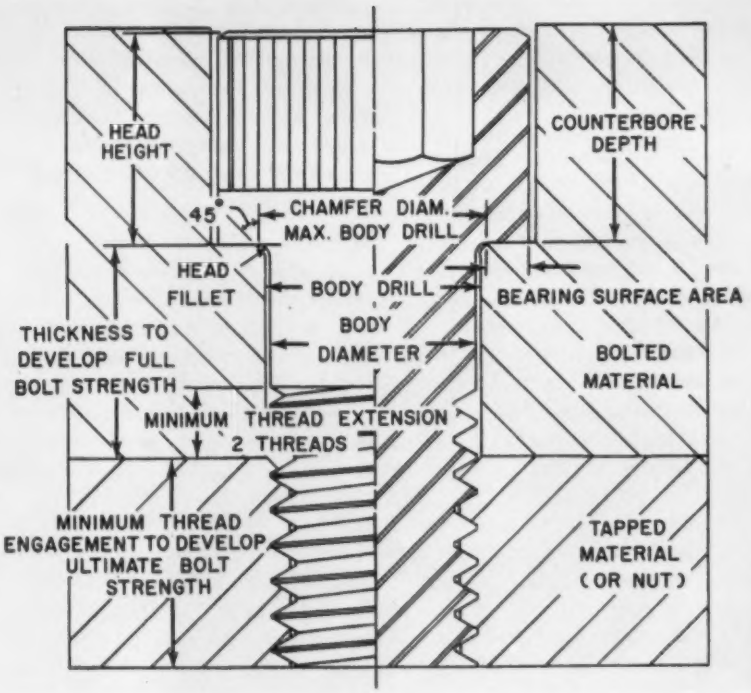


FIG. 2: A fatigue-resistant fastening needs an ample head-to-shank fillet, a chamfered bolt hole, plenty of bearing-surface area, load distribution over a number of threads, and an extension of two or three threads above the tapped material or the nut.

the end of a wrench. Multiply this force by the length of the wrench lever arm to get applied torque, then substitute it in the preceding formula to calculate induced load. This rough calculation will be several hundred percent more accurate than no measurement at all, and certainly better than tightening a 150,000-psi-yield fastener to a mere 5000 or 10,000 psi as is often done.

Need Positive Lock — Once a fastener is properly tightened it should be maintained at that preload level. Part movement, temperature changes, and vibration will tend to work any screw thread loose eventually. This calls for some positive means of locking.

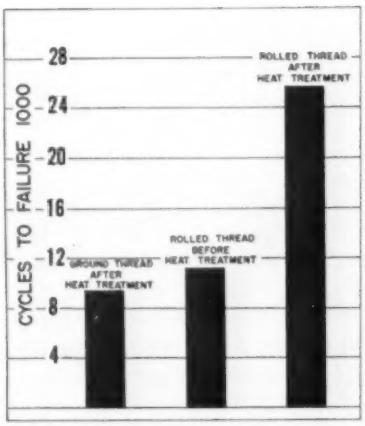
Lock wires and cotter pins are commonly used, but they impose penalties of extra parts, machining, and assembly work. There is a tendency with these devices to tighten bolts firmly but then to back off as much as necessary to get the pin or wire through a drilled hole. Thus some preload is lost before the bolt ever gets into action.

Preferred over lockwashers on many jobs are locknuts of the prevailing-torque type; these also serve as stopnuts. For tapped holes, there are male threaded fasteners with nylon inserts that act as one-piece, self-locking screws. Where future disassembly is not necessary, tack welding, keying, or cementing will keep screw threads in place.

Some Other Rules — Although "tighten them and keep them tight" is a cardinal rule in preventing fatigue failure, there are other important requirements. Most of them come under the heading of sound practice in bolt assembly.

For example, there must be enough bearing area under both the bolt head and the nut to prevent indentation of softer material and corresponding reduction of the preload. Washers may be needed to increase the bearing area.

Then, too, the edges of bolt and washer holes should be chamfered. This prevents any chance of a sharp edge knifing into the critical head-to-shank fillet of the bolt. Such nicks can be points of stress con-



ROLLING WINS OUT: Fatigue tests on ½-20 parts fabricated from AISI 8740 material heat treated to 160,000-180,000 psi, prove rolled threads best.

Table of Surface Finish (F) Factors for Torque Equation

Fastener Material	(F) Factor
Unplated alloy steel	0.20
Cadmium plated alloy steel	0.15
Highly lubricated alloy steel	0.11
Aluminum	0.15
Austenitic stainless steel	0.30

centration which lower fatigue life. Also, if a thread sets on a sharp edge, there may be serious preload loss as the edge breaks down under working loads.

Watch Alignment — Misalignment of bolt, nut and tapped hole must also be kept to a minimum. As little as one degree of angularity between a bolt head and its seating surface can cut fatigue life by as much as 90 pct.

Sometimes the misalignment may occur under load, as in the buckling of a plate or member that is fastened after load is applied. The resulting cocking or bending of the bolt speeds fatigue failure.

As for threads, at least two should be left free of engagement above the nut or tapped hole (between the engaged thread and shank) after the fastener is fully tightened, Fig. 2. This minimizes stress concentrations where the thread runs out onto the shank. It also lessens the chance of binding these oversize runout threads, in which case tightening torque acts to deform metal, not to increase the clamping force.

Spread the Load—Spreading the load over a sufficient number of threads not only prevents thread stripping but also minimizes stress concentrations that produce fatigue failure. Thin nuts or those with non-load-carrying locking inserts may be inferior in fatigue strength if they do not distribute the load well enough.

Where holes are tapped they should be deep enough to prevent bottoming. Pushing against the bottom of a hole doesn't put torque energy into preloading where it belongs. But it is a good way to invite fatigue failure.

To do the best possible job in preventing fatigue failures by using all available bolt strength, it's also important to check fastener design. Knowing several vital facts will help:

1. Good bolt designs have sufficient fillet radius to minimize stress concentrations under the head—the larger the better. But remember, there must be enough bearing area to prevent indentation of softer materials.

2. The head must be square with the bolt shank—certainly within one degree of absolute squareness for any job with significant fatigue loading.

3. The wrenching surface or recess must be strong enough for the tightening job. Positive wrench engagement, as with internal hexagon sockets or 12-point external wrenching heads, is essential.

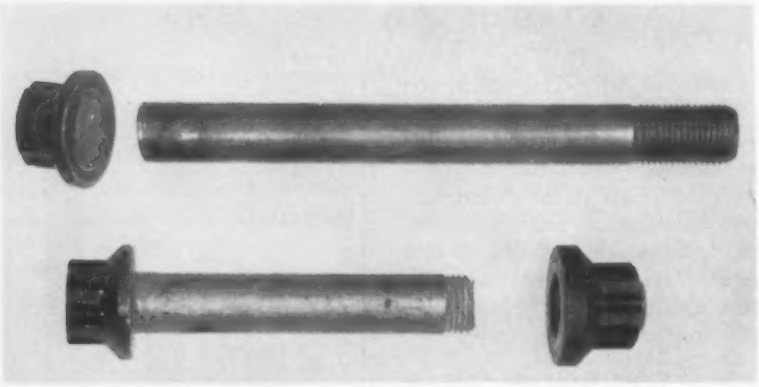
4. Shallow, smooth thread contours are best. They have less notch sensitivity and correspondingly less tendency to fail in fatigue.

5. Thread forming techniques influence both thread and head fatigue strength. Forged heads and rolled threads are preferred.

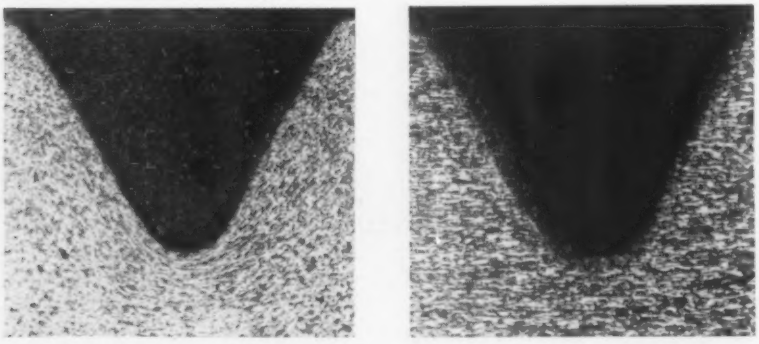
6. Thread runout onto the shank should take place over several turns of thread. This minimizes discontinuity and any tendency to concentrate stresses at this critical point.

7. Surface finish is important since fatigue failure is essentially a surface phenomenon. The smoother the finish, the better

8. Excessive decarburization plays havoc with fatigue endurance. But carburizing produces even more trouble: a brittle, notch-sensitive condition. A well controlled surface carbon content is the answer.



TYPICAL FAILURES: Two critical points of potential fatigue failure in bolts of any design are at the head-to-shank fillet and in the threads at the bearing face of the nut.



WATCH FLOW LINES: Enlarged section of rolled thread (left) shows that strength-giving flow lines are intact, also very dense at the critical root. Cut thread (right) lacks flow-line continuity.

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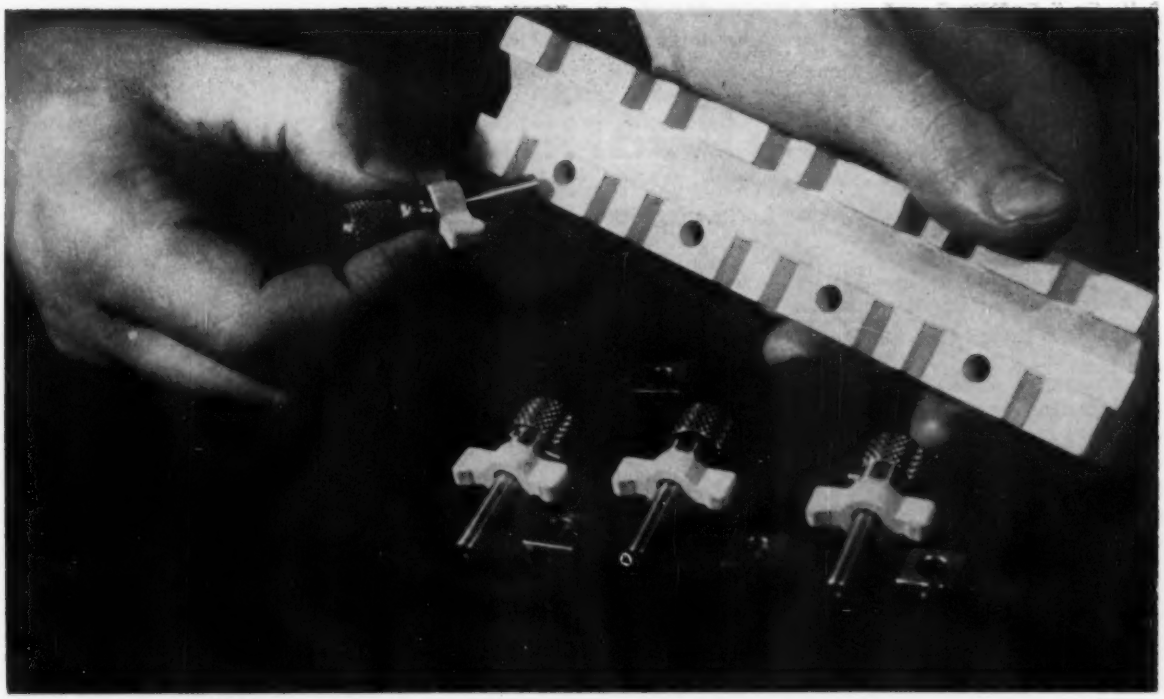


DESIGNED FOR HEAT: Ceramic clamping elements exert positive pressure to hold parts against ceramic base.

Fixture Resists High Heat Without Warping

High brazing temperatures cause loss of tolerances unless fixtures can withstand the heat without warping.

Ceramic tooling is a good choice for this precision job.

▪ While silver brazing joins precision parts at minimum cost, the fixtures for holding the parts have to withstand 1800°F furnace heat. The problem is to find a material that won't warp, distort, oxidize, or allow molten brazing alloy to weld an assembly to the fixture.

Ceramic tooling offers a solution. Duramic Products, Inc., New York, has developed both the material and fabrication techniques, using Duramic Sur-Braze M120-F, a fired aluminum-silicate with heat resistance to 2000°F. The ceramic fixtures hold tolerances as close as ±0.0005 in.

For Precision Lever— Made for an aircraft manufacturer, one type of fixture holds four 4340-steel lever assemblies. Two of the 7 x 1½ in. fixtures can be placed in a 4-in. furnace opening.

The hardware is made of Inconel, since its construction in ceramic would offer no advantages. The clamping elements are ceramic because of their contact with the molten alloy.

Instead of using threads, a pin and nut arrangement loads the ceramic in compression. A quick-acting cam locks the assemblies into the ceramic and exerts positive pressure on the assembly during the brazing cycle.

Low Thermal Expansion—After firing the ceramic is precision ground to the ±0.0005-in. assembly tolerance. Because of its low thermal expansion (1/6 that of steel), the fixture holds its dimensions accurately throughout the brazing cycle.

Sur-Braze M120-F has found its way into other high temperature uses: induction heating jigs, spot and projection welding locators, transistor alloying boats, glass-working tools, and electrical insulators.

Take Care of Oil Seals For Longer Bearing Life

By E. W. Fisher—Manager, Product Engineering Dept., The Garlock Packing Co., Palmyra, N. Y.

The lifeblood of any modern machine is the oil that lubricates its bearings.

Guarding the supply against loss or contamination is a job for thin rings of packing called oil seals.

Literally bearings in themselves, oil seals demand careful attention at all times.

▪ Lubrication problems mount as manufacturing equipment gets bigger. Mirror-surfaced bearings turn on a precious film of oil while they support massive loads. The job of containing this oil and keeping it free of foreign matter is assigned to an oil seal at the end of each bearing. The way it functions largely governs oil life and the amount of makeup necessary.

Consider what a seal is and how it works. It is a device which holds a flexible member in close, spring-loaded contact with a revolving shaft. Inasmuch as the spring creates a load, the seal unit as a whole becomes a bearing.

A Few Differences—But, unlike a normal bearing, an oil seal does not have a fixed inside diameter. It has no running clearance. It has no provision for generating its own oil film. In fact, it must be designed to minimize the thickness of any oil film in order to prevent excessive leakage.

Also, with good bearing conditions established between the seal and the shaft, the seal must not let the shaft move radially from its principal bearing contact. The seal should not restrain the shaft in any way. Instead, it should float freely with it. This floating action demands a flexible seal but not a soft one. Soft materials do not make particularly good bearings.

Handle With Care—Thus, if oil seals are essentially bearings, they should be handled like bearings. To keep them free of dust and dirt they must never be placed carelessly on a storeroom floor, nor hung on a wall peg.

Seals should be driven into their chock recesses with a piece of wood of ample size and having a clean, square driving edge. The actual driving should be done slowly and evenly to avoid distortion or damaging effects to lips and springs.

Another essential: the shaft should be smooth. The smoother the shaft, the better the seal-type bearing will perform.

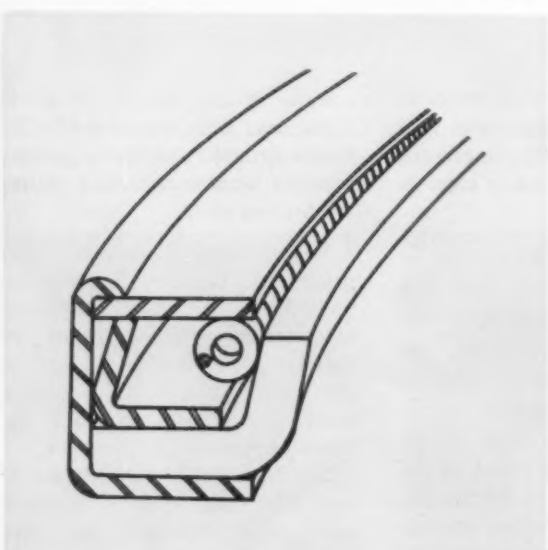


FIG. 1: Early form of seal was a leather "hat" or flange packing with a coiled or garter spring wrapped around the lip section.

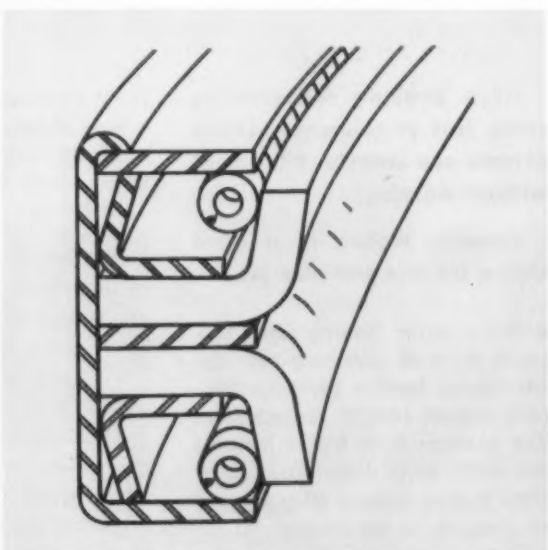


FIG. 2: Dual leather seals in a single case directed one lip toward foreign material and the other inward toward the bearing and oil.

As a bearing, the seal also needs lubrication. Where a single seal is used, the lubricant from the bearing itself will handle this job adequately. But the problem is more critical where two seals are used. It has been customary to introduce lubricants between the two seals. Such a plan, if set up and carefully followed, is an important aid in achieving reasonable seal life.

Use Same Lubricant—On older, slow speed mills it is fairly satisfactory to inject grease between the seals at periodic intervals. However, since the lubricant that is fed to the seals will also find its way into the bearing lubricant, the same type and grade should be used for both components.

For example, feed oil to the seals if you are using oil to lubricate sleeve type bearings. But feed seals with grease if that is what your roller bearings require.

Some oil-lubricated high speed mills have a separate pump which meters a trace of oil to the bearing seals continuously. Such set-ups indeed recognize that oil seals are bearings which must be lubricated.

Design Progress — For the past 15 years, more and more attention has been directed toward improved oil seal materials and designs. Many varieties and combinations have been tried. One of the oldest is the leather "hat" or flange packing enclosed in a metal case. It had a coiled or garter spring wrapped about the sleeve or lip section that surrounds the shaft, Fig. 1.

Such seals were often used in pairs assembled in a single case, Fig. 2. Where considerable scale or water was present, it was customary to face one lip out toward the foreign material and the other in toward the bearing and oil. The outer seal was given added protection in the form of a "boot"—a bronze or Bakelite ring in the basic form of a rotary or face type seal.

But as speeds went up and service conditions became more severe, the sealing problem grew more critical. Too much oil loss and too much water leakage into the lubricating oil called for frequent seal replacement.

Another Step — At about this time the first composition seals appeared (Fig. 3). They were molded from oil resistant compounds to form fairly firm sealing members. They also featured a tempered steel finger spring composed of a series of lugs. Each lug operated independently and locked into the seal so that it could not fail when the assembly was removed for servicing.

To combat persistent leakage of oil, spring loads were increased. This only served to score shafts and to cause seals to harden and burn up.

Analysis then showed that lightly loaded seals having the smallest possible shaft-contact area would run cooler. However, light loading called for more flexibility in the seal, and the small area of contact required a more perfect seal.

Seal designs were modified accordingly, and the use of moldable synthetic rubber compounds has developed rapidly. Flexibility is gained through better cross sectional design, Fig. 4.

Improved oil seal materials are still sought, however, and some show considerable promise. Silicone rubbers, for example, are only slightly affected by heat. Then there are new butyl compounds which show remarkable resistance to deterioration in contact with certain synthetic lubricants.

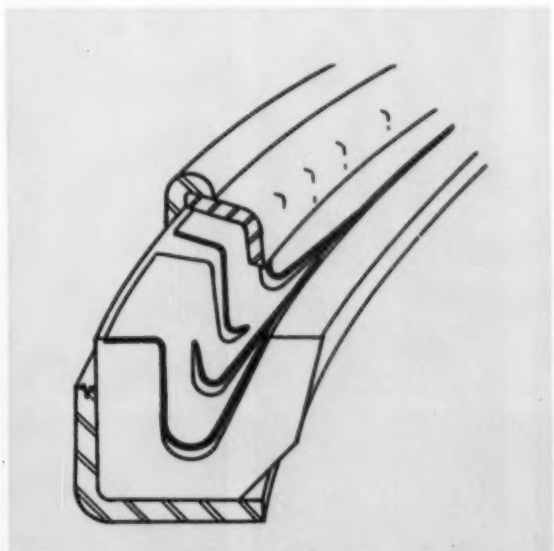


FIG. 3: Oil-resistant composition seals, a forward step from the leather types, featured steel finger springs for tight sealing.

FIG. 4: Modern seals, molded of synthetic materials, use flexible springs to keep a thin seal lip in light contact with the shaft.

Three New Pore-Free Ways To Weld Aluminum

By F. R. Baysinger—Head, Welding Branch, Dept. of Metallurgical Research, Kaiser Aluminum & Chemical Corp., Spokane

Porosity in aluminum welds—caused by entrapped hydrogen—has always been a shop headache.

Three new welding processes solve the problem by combining special techniques with optimum combinations of shielding gas. In many cases, they provide better weld quality at lower cost.

■ Three new metal-inert-gas welding techniques for welding aluminum have been developed as a result of research originally aimed at eliminating weld porosity. In addition to solving porosity problems, one of these same techniques does away with dross in aluminum welds.

The new processes, named Qualiweld, Econoweld, and Chlorecon, were developed by the Dept. of Metallurgical Research of Kaiser Aluminum & Chemical Corp. Almost as important as their metallurgical virtues is their claim to appreciably lower welding costs.

Trapped Hydrogen—Welders of aluminum are only too familiar with the problem of weld porosity. But to solve the problem, it is first necessary to determine its cause. As a result of two years of basic research, Kaiser metallurgists have demonstrated quantitatively that hydrogen is the main cause of porosity in aluminum welds.

The way hydrogen causes weld porosity is explained by the hydrogen solubility curve for aluminum. Molten aluminum has a fairly high affinity for atomic hydrogen and readily dissolves it.

On the other hand, solid aluminum can contain very little hydrogen. The gas is rejected as the metal freezes. If the cooling rate is rather high, such as in a weld, the hydrogen cannot bubble out to the surface. Instead, it is held within the metal as it freezes, forming gas porosity.

Causes of Porosity — To prove that the presence of hydrogen in the arc always causes porosity, tests were conducted in which hydrogen and hydrogen-containing contaminants were added to the metal-inert-gas arc in varying amounts. Tested were hydrogen, propane, and water vapor additions. Hydrated oxide finishes on the weld wire were also used as a source of contaminants.

In every case, with an increasing amount of contaminant, there was an increase in the level of weld porosity. For example, Fig. 1 shows the

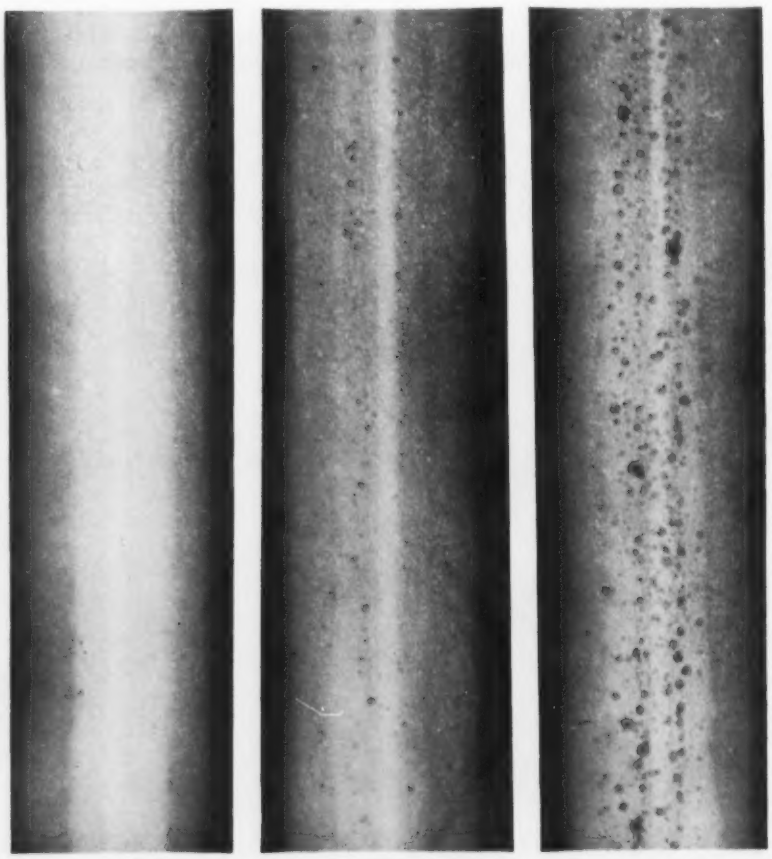


FIG. 1: Radiographs show how porosity increases with increased hydrogen. Left: argon; center: argon $+0.25$ pct H_2; right: argon $+1$ pct H_2.

effect of adding hydrogen to the shielding gas. Addition of only 0.25 pct hydrogen brings the porosity level in a weld below ASME Unfired Pressure Vessel code acceptable radiographic standards.

Other Causes—Hydrogen in any chemical compound on the filler wire is the main source of this contaminating gas. Other causes of porosity in metal-inert-gas welds include: 1) improper degassing of the ingots which are subsequently rolled into plate or drawn into wire, 2) entrapment of shielding gas in the molten pool, 3) loss of the shielding efficiency, and 4) contamination which seems to result from air coming down the inside of the contact tube.

Increasing porosity levels cause a lowering of mechanical properties as shown in Fig. 2, in addition to radiographic rejection of welds.

Lowers Ductility — Dross in an aluminum weld (essentially aluminum oxide) can be formed at the time of welding, result from residual dross in the wire or plate, or derive from preceding weld beads. Excessive oxygen in the shielding gas or the presence of oxygen in any chemical compound on the filler wire will also tend to form dross. Dross has a rather severe effect upon weld ductility and mechanical properties.

To eliminate the filler wires as a source of hydrogen-caused porosity or of dross, it is necessary to produce weld wire which, at the time of use, is free of hydrogen and oxygen. The weld wire must also be free of hydrocarbons and heavy oxide films.

Halogens Help—Kaiser researchers studied the use of halogen additions to the arc to eliminate weld porosity caused by hydrogen. The results from adding chlorine to the argon shielding were favorable but erratic. In some instances, there was a marked improvement in porosity. In others, the improvement was less than desired. Results showed a need to develop an improved method of using chlorine to assure that code quality metal-inert-gas welds would always be obtained.

The desired results were obtained when an MIG gun was modified so that an argon-chlorine mixture could be introduced through the contact tube in addition to the regular flow of shielding gas through the gas nozzle. This carried the argon-chlorine mix directly into the arc inner cone. This arrangement is the basis for the Qualiweld process, shown schematically in Fig. 3.

Boosts Quality—It adds up to a more effective method of adding chlorine. Using this method, a radiographic improvement of from 1 to 3 radiographic grades was obtained. It was possible to take a wire so badly contaminated that it gave a weld below ASME Unfired Pressure Vessel code radiographic quality and, using the new technique, bring up the quality of the weld deposit to within code standards. Fig. 4 shows how the process can improve a weld.

The Qualiweld process is suitable for welding in all positions. Argon-chlorine is used for flat position welding, and helium-chlorine for the vertical and overhead positions. The mechanisms involved in how chlorine improves weld quality are not known.

Defines Hazards—What is the effect of chlorine on the operator? Using the contact tube method, chlorine is added to the shielding gas in amounts no more harmful than the fluorides which are present in the arc atmosphere of a stainless steel metal arc electrode.

What is the effect of chlorine on equipment? Obviously a chlorine gage should be used, although all development work was done with standard regulator equipment. Introducing the chlorine through the contact tube circumvents damage to

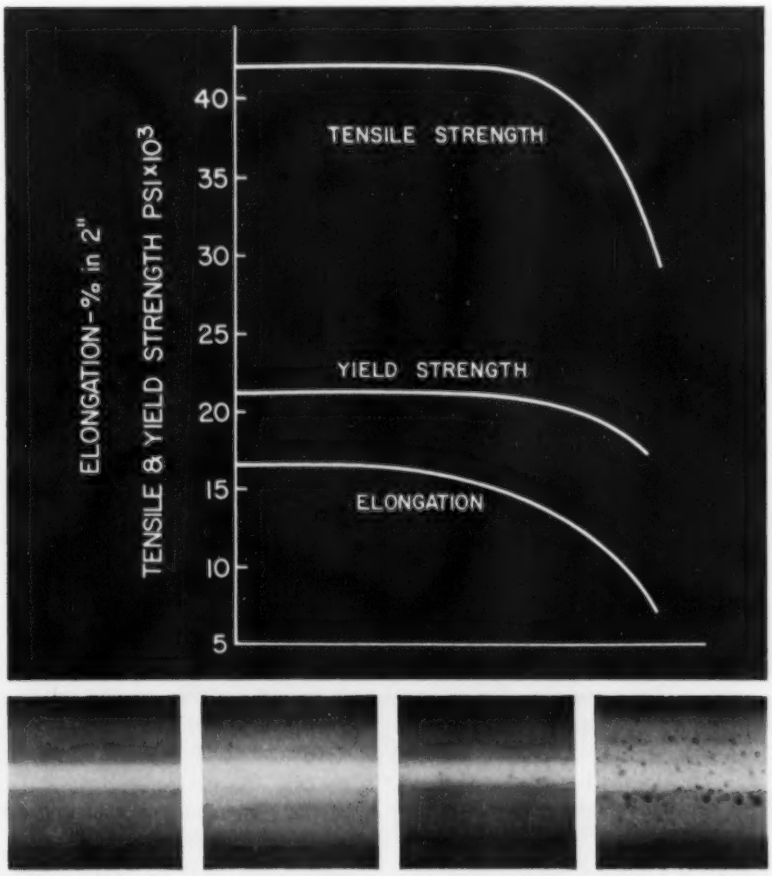


FIG. 2: Here's how weld porosity affects mechanical properties of 5083-H113 material. Soundness is synonomous with strength.

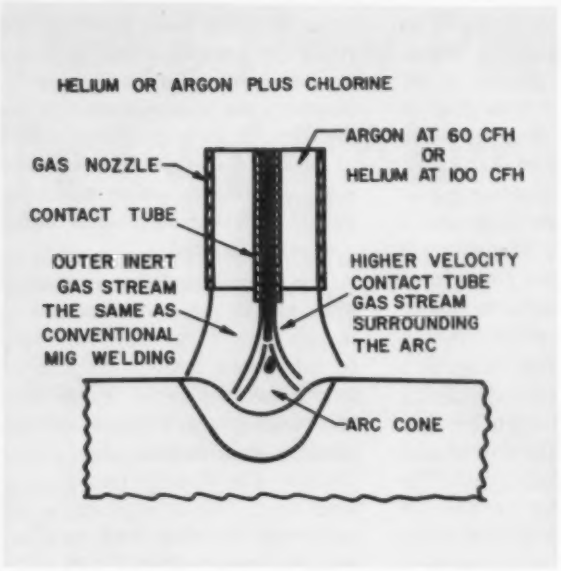


FIG. 3: In addition to the regular flow of shielding gas, the Qualiweld process uses an argon-chlorine mixture which is fed through the contact tube.

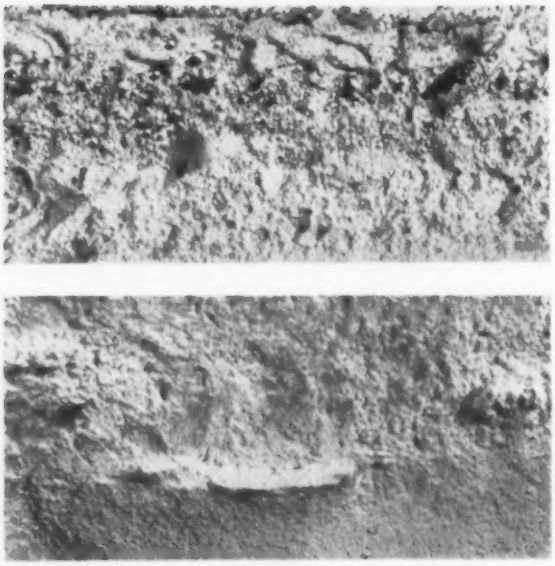


FIG. 4: Using the same wire and plate, the Qualiweld process results in less porosity (bottom) than by MIG process as fractures show.

the equipment. Copper contact tubes will react with chlorine to form a copper chlorine compound on the inside of the tube. Presence of this compound will eventually cause loss of control of the arc.

Use Plating—The contact tube should be nickel plated or made of nickel or stainless steel. With nickel plating, an eight-hour contact tube life can be expected before the plating wears through.

The Econoweld process was developed to weld aluminum with little or no argon. Nitrogen was studied as a possible substitute for argon in the shielding atmosphere. It was felt that the contact tube process might work if the argon down the contact tube would protect the immediate arc area. Nitrogen might then be used for the remainder of the shielding area.

Troublesome Nitrides — Welds were attempted with argon introduced through the contact tube, while nitrogen provided the regular gas shielding, as shown in Fig. 5. The process would deposit single pass welds. But there was an impenetrable nitride film on the top of the weld making multipass welds impossible.

One of the welders—in changing the arc length control—found that at the low end of the range the arc, instead of snuffing out, submerged below the surface of the weld, broke through the nitride barrier, and continued welding. This buried-arc technique is the secret of the Econoweld. Radiographs of typical Econowelds are shown in Fig. 6.

The process can be used on EC, 110, 3003, and 6061 aluminum. It is not recommended for use on any aluminum alloy containing much magnesium. A reaction occurs between nitrogen and magnesium. However, the use of the Econoweld process will make possible low cost welding. An example is that of welded busbar used in substations.

Versatile Coverage—Of the three new welding processes, the Qualiweld process is essentially for high quality welding. The Econoweld process is for non-code welding. A third new process — known as Chlorecon—is a low-cost, code-quality metal-inert-gas process that can be used for welding all alloys in all positions.

This last process was the result of test work done with low shielding gas flows. Commercial quality welds in all positions in a draft-free area were obtained with flows as low as 15 cu ft of pure argon. However, the amount of dross present in the weld was too high to pass the code bend test.

New Savings—Part of the quality problem was believed to be due to the contaminating effect of the contact tube. It was believed that the contact tube method using argon-chlorine down the contact tube with a low flow of shielding gas in the regular nozzle might give better quality welds than low flow methods through the regular gas nozzle. Significantly, this alternative would still have the economy of low flow. The Chlorecon process is shown in Fig. 7.

As a result of tests, it was concluded that a total flow of 20 cu ft of argon-chlorine and argon would produce good quality welds in the flat position. Code quality welds meeting all bend tests were obtained when the filler wire was free of oxygen and hydrogen.

In the vertical and overhead positions, it was much more difficult to obtain good quality welds. With combinations such as argon-chlorine down the contact tube and argon-

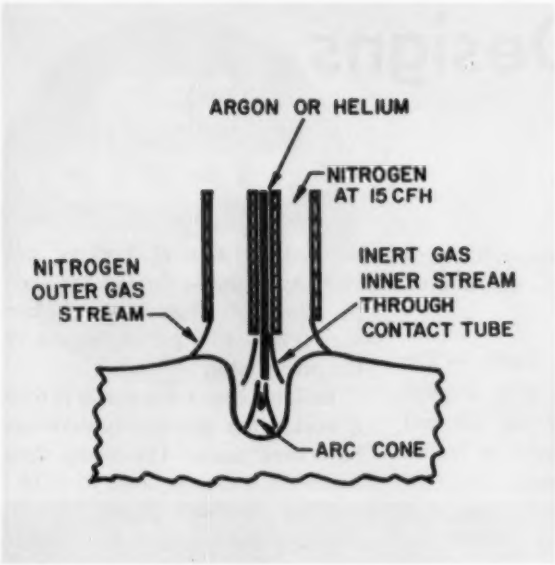


FIG. 5: Basis of success for Econoweld process is buried-arc technique. The arc successfully breaks through a resistant nitride barrier.

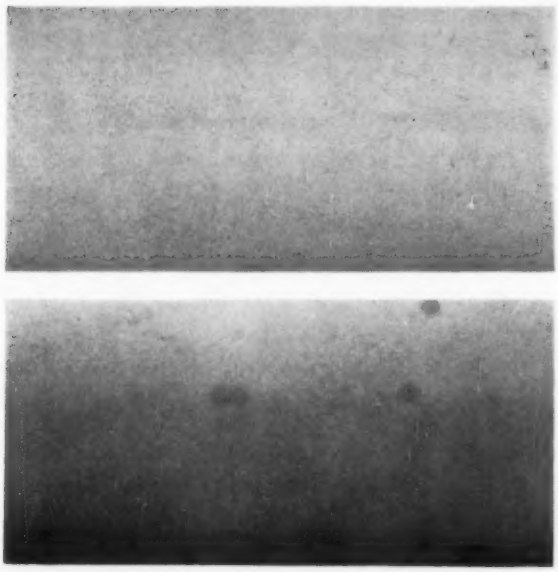


FIG. 6: There's little or no porosity in Econowelds made in 1½-in. thick EC aluminum plate. Careful radiographic inspection provides the proof.

helium in the outer shield, code quality welds were obtained in the vertical and overhead positions.

Useful Helium—Fig. 8 shows the beneficial effect that helium has on the porosity level. Somewhat higher gas flows than those used in flat position welding are required. But these flows are less than those required by conventional techniques.

In the Econoweld process, 5 cfh of argon and 15 cfh of nitrogen are used. With argon at $0.10 per cu ft, and nitrogen at $0.02 per cu ft, the total cost per arc hour comes to $0.80. This is a saving of $5.20 per arc hour over conventional metal-inert-gas welding.

The Chlorecon process results in a saving of $4.00 per arc hour over conventional techniques.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

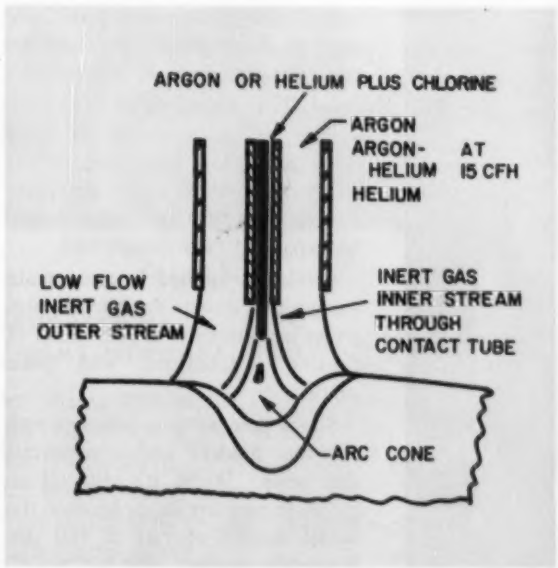


FIG. 7: In this welding method, called the Chlorecon process, a low-flow outer stream of inert gas surrounds the inner stream.

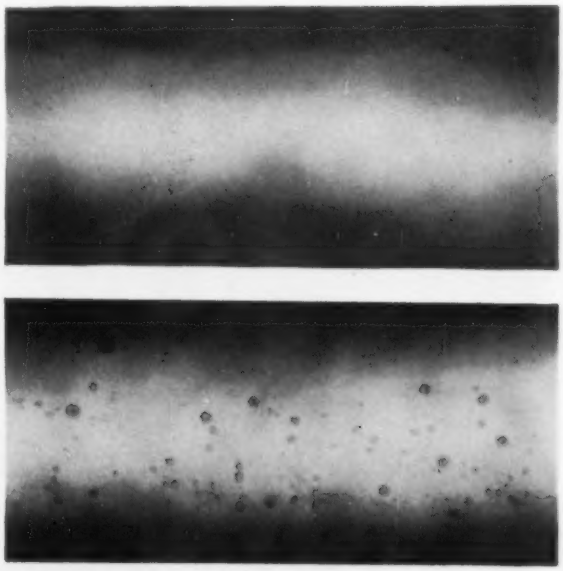


Fig. 8: These two radiographs show how helium mixed with argon (top) produces a porosity-free weld when used for the outer shield with the Chlorecon process.

Models Pretest Designs for Gas Flow

Engineers can only predict proper gas flow for a given design.

Model studies eliminate costly changes in full-scale installations.

▪ Bring gas to a dust precipitator without turbulence and you can increase efficiency and capacity of the unit. But flue design varies so much from plant to plant. How is it possible to insure proper gas flow? Research - Cottrell, Inc., Bound Brook, N. J., overcomes the limitations of rule-of-thumb design methods by turning to model studies.

Pressure Drop is Costly — The greater the pressure drop through the flues, the larger the fan and motor must be to force or induce gas through the system. It's estimated that a pressure drop of 1 in. (water gage) has a direct dollar equivalent of $40,000 to $80,000. The models have made it possible to design flues to reduce losses from ¼ to over 1 in.

Transparent plastic models were selected for ease of working and visibility of smoke through the plastic. Costs of models built to date vary from 1 to 2 pct of the cost of the precipitator.

Building time for a model is 6 to 8 weeks after preliminary drawings have been made. The model shop scales the drawings down to 1/16.

Parts are cut from 3/16-in. Plexiglas sheets. In a few models ⅛ and 1/16-in. sheets are used. A 5000-cfm fan driven by a 25-hp motor induces room air into models. Two smaller blowers are also used.

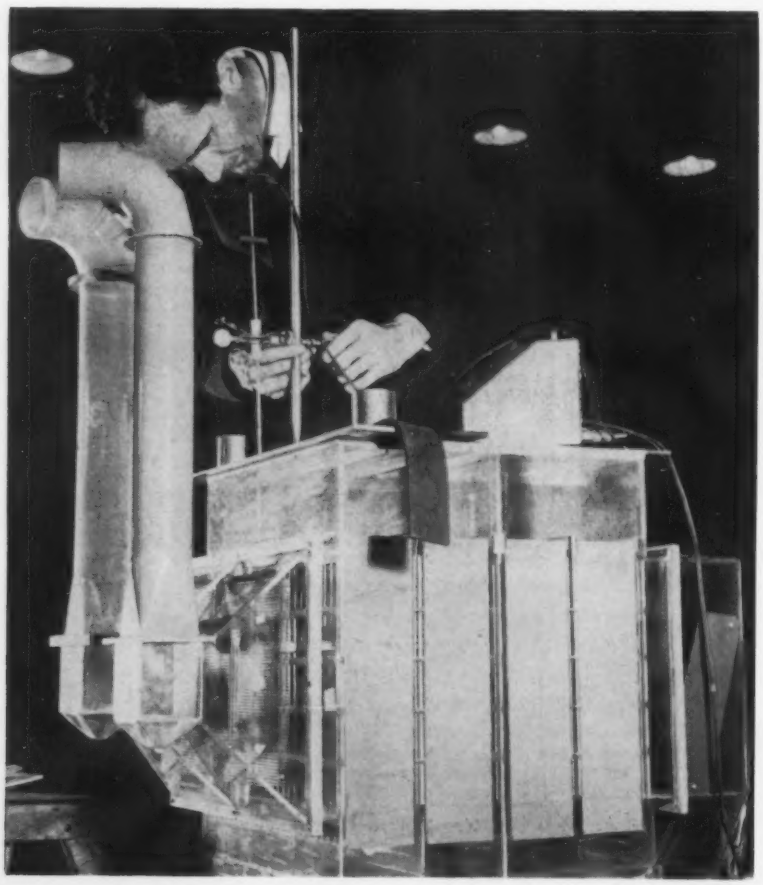
Engineers study flow patterns by means of smoke, threads, ribbons, ground cork, or dust. Anemometers and pitot tubes are used to take velocity and pressure measurements.

Points to Savings—The studies show that some parts can often be eliminated or their function replaced by less costly devices. For instance correct flue design can eliminate the need for dropout hoppers. Model studies showed that some hoppers increase turbulence and pressure drop. Soot-blowers can replace hoppers to prevent dust build-up.

The results of studies of many cases since the beginning of the program in 1950 have convinced the company that the service should be expanded as a design tool.

Service is applied in three main categories: direct design of proposed installations; improvement of existing installations; and basic studies.

Shock flow patterns correlate well between models and commercial size units. While it's difficult to correlate pressure drop, because the model doesn't operate at full size Reynold's number, this has no effect on shock pattern analysis so long as flow is above the critical value.



TEST IN MINIATURE: Technician adjusts anemometer to measure gas flow through scaled-down model of precipitator.

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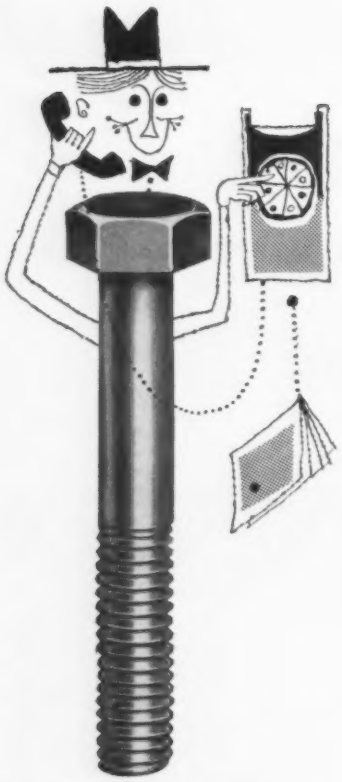

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You Arbitrate It!

COFFEE BREAK

From the files of
The American Arbitration Association

One afternoon Steve P., a platform helper in an air conditioning manufacturing plant, wandered off company property to a nearby cafe for a cup of coffee. The facts were in doubt as to how long he was gone. He said 15 minutes; the company said it was more like an hour. But there was no doubt about what happened next. He was handed a dismissal notice which claimed that he not only left work without permission, but that in failing to punch out he showed he intended to let the company pay for unworked time. This, the personnel manager said, was "dishonesty" which justified immediate dismissal.

A grievance was filed. The union admitted Steve had broken a company rule but said that discharge was too severe a penalty for a first offense.

"First offense nothing," answered the personnel manager. "Just look at this record." He then produced a complete dossier, showing that Steve made a habit of breaking every rule in the book, from smoking where he shouldn't have to loafing on the job. Apparently, supervision had been keeping a close watch on Steve, quietly adding to the record of his infractions without saying anything to him.

Surprises Union—This took the union by surprise. But the shop steward was not at a loss for words. "Keeping a secret file on a man is a sneaky thing to do," he exclaimed. "And that's just one more bit of evidence that you were discriminating against Steve."

Eventually, the case went to arbitration under the rules of the American Arbitration Association.

The Arbitrator Ruled:

He said it was easy to see how the company would be provoked at all the offenses committed by Steve and would regard the most recent one as a "last straw." But it was

(Continue on following page)

NEW BOOKS

"Productivity, Prices & Wages," by Prof. Jean Fourastie, Conservatorie National Des Arts Et Metiers, Paris, deals with European industry. But it draws on some American experiences. Principally, it takes a long, hard look at productivity trends. The author has an unorthodox approach; he bypasses the statistical problems of "matching" production and employment figures. Instead, he feels that price and wages are both determined solely by the state of technical progress. 115 pp. $1.50 per copy. Organisation for European Economic Co-Operation, Suite 1223, 1346 Connecticut Ave., N.W., Washington 6, D. C.

"Copper & Copper-Alloy Arc-Welding Electrodes" is a joint ASTM-AWS specification booklet. It covers (for the first time) two types of stranded aluminum-bronze electrodes (ECuA1-A2 and ECuA1-B). And it standardizes ECuA1-A2 aluminum-bronze electrode for use with the submerged arc process. 10 pp. 40¢ per copy. American Welding Society, 33 W. 39th St., New York 18.

The Arbitrator Ruled:

(Continued)

his opinion that since the company did not discipline Steve for the earlier violations, or even speak to him about them, they could not be considered in this case. Steve's absence and the attempt to collect pay for time not worked would have to be regarded as a first offense. In view of the company's past practice for first offenses of that kind, the discharge was commuted to a two-week layoff without pay.

Caution: The award in this case is not necessarily an indication of how arbitrators might rule in apparently similar disputes. Each case is decided on the basis of the particular history, contract, testimony and other facts involved. Some of these essential details may have been omitted in condensing the original arbitration for brief presentation.

Ceramic engineers examine new HKP Silica Brick roof.

20% LONGER ROOF LIFE with HKP Silica Brick

A large western steel company reports that installation of HKP Super Duty Silica Brick increased their open hearth roof life by 20% over a one-year period. And in comparison with the next best refractory, HKP Silica Brick averaged 13% more heats to the first patch. This is a remarkable record—another instance where Porter products help keep the refractory cost per ton down.

THE REASON: HKP Silica Brick is composed of carefully selected raw materials, and is under strict quality control through every step of its manufacture. The result is a stable product with uniform characteristics and consistent quality. Users depend on it to perform with a minimum of variation in service.

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Proof of Vulcan Tool Steel Superiority

Examining piercing punch of Vulcan Alidie High Carbon-High Chrome Tool Steel are Ralph Claypool, left, stamping foreman, Long Manufacturing Division, Borg-Warner Corp., and Tom Varley, right, Vulcan Sales Engineer.

35 ton Stoll Press die assembly enlarges and trims center holes in pre-hardened clutch plate.

REDUCES TOOL MAINTENANCE COSTS BY 87%...

Vulcan Alidie Tool Steel!

Vulcan sales engineers, cooperating with engineers of Long Manufacturing Division, Borg-Warner Corporation, reduced sharpening of die and punch tools from *once every 2 days to once every 15 days.*

Long Manufacturing Division produces clutch plates for commercial vehicles and industrial trucks. Pre-hardened material is SAE 1065, with a hardness of 41/46 Rockwell C. Thicknesses range from .040" to .090" x various diameters.

Costs and downtime were lowered because Vulcan engineers recommended the *right* steel for the job: Vulcan Alidie High Carbon-High Chrome Tool Steel with a hardness of 61/63 Rockwell C. This same engineering help is available to you without charge.

For the name of your nearest Vulcan representative, all you have to do is write, wire, or call collect: *Vulcan Crucible Steel Division, H. K. Porter Company, Inc., Aliquippa, Pa.*

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VULCAN CRUCIBLE STEEL DIVISION

TECHNICAL BRIEFS

Supertight Fasteners Withstand Shock

When vibration shakes loose fasteners, you use locknuts, of course.

But what happens when the fasteners are hit by super vibrations from heavy presses, etc?

The answer: supertight fasteners.

■ Self-locking socket screws provide an answer to a fabricating firm once plagued with fastener problems. Prior to use of these self-locking bolts, it was extremely difficult to maintain tight fasteners on heavy presses subject to severe shocks and vibration.

The company, The Prosperity Co., Inc., Syracuse, N. Y., operates hydraulic presses of the 500 and 1000-ton capacity. These blank, pierce, stretch and form a wide variety of commercial laundry equipment. Blanking and piercing runs on boiler plate up to ½-in. thick and on stainless grades to ¼-in. caused frequent loosening of bolts.

Maintenance Cost Money—Weekend maintenance on the presses was accepted routine. Two men with torque wrenches every week took three hours apiece (at Saturday time-and-a-half rates) going over the press to cinch down all fasteners.

When this maintenance had to be done during the regular work week, lost production time was an additional expense.

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 151. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Installation of self-locking cap screws at critical press points has reduced this maintenance problem sharply. The firm reports maintenance crews now have to tighten fasteners on the 1000-ton press only every five months. This is a reduction of nearly 90 pct. On the older 500-ton press (which has been in production for between 12 and 15 years, often on two-and three-shift operation), tightening is necessary about once every four weeks. This is a more frequent schedule because threads in the tapped holes have stretched.

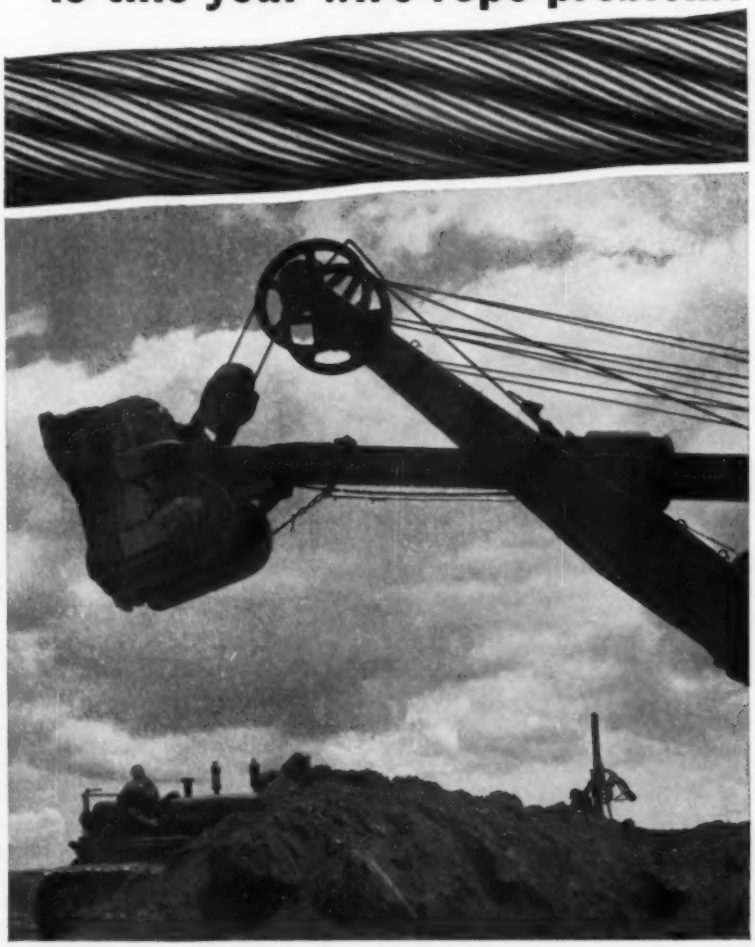
Screws Have Nylon Lock—The cap screws used are made by Standard Pressed Steel Co., Jenkintown, Pa. They are made self-locking by a nylon insert in the threaded section. The resilient nylon pellet is compressed by the female threads as the bolt is installed in the tapped hole. It exerts an outward pressure which forces mating threads firmly together. This provides extreme friction needed to keep the fasteners in place under heavy shock or vibration.

Worker tightens locknuts on ram of a 500-ton press.

The result is a re-useable standard screw or bolt. It's self-locking without locknut, lockwire or pin or any special machining or staking. The nylon pellet retains resiliency (and holding power) for repeated tightenings.

bending fatigue...

is this your wire rope problem?



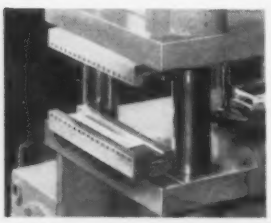
FREE Red-Strand Service Bulletin No. 105 brings you the answer you're after!

Do broken wires start showing up much too soon after you put a new wire rope into use? If so, costly bending fatigue is probably the explanation. Fortunately much of the expense it causes can be eliminated by following the simple procedures explained in Red-Strand Wire Rope Service Bulletin No. 105. This is one of a series devised to help wire rope users get better service without spending more money. Copies are sent on request. Write H. K. Porter Company, Inc.—Leschen Wire Rope Division, St. Louis 12, Mo.

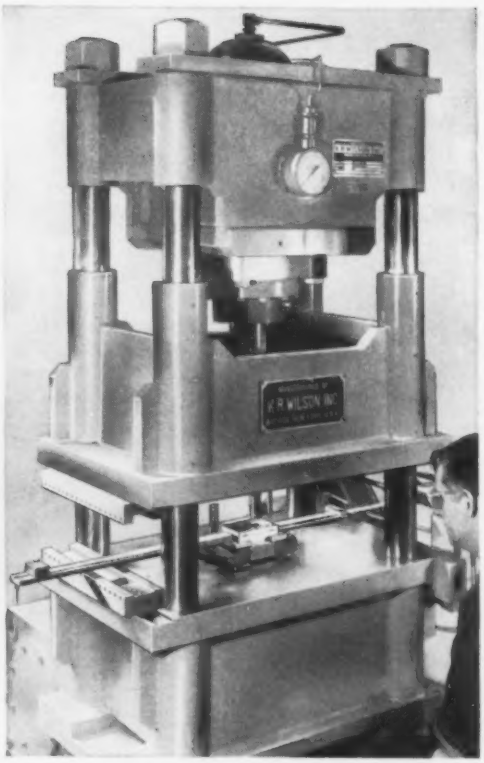
LESCHEN
Red-Strand
WIRE ROPE

H. K. PORTER COMPANY, INC.
LESCHEN WIRE ROPE DIVISION

Case History
No. 12
E. H. Titchener & Co.
Binghamton, N.Y.



This close-up shows how the E. H. Titchener & Co. uses the 3" x 24" slide and platen outboards to install breaking dies and use them without affecting the normal working area of the press.



VERSATILE, MULTI-PURPOSE PRESS SOLVES PROBLEM FOR E. H. TITCHENER & CO.

"Give us a die tryout press which incorporates critical tolerances, provides a wide range of versatility and, if possible, build it to be used for die development and die tryout simultaneously on various units that are independent of each other." This was the problem the E. H. Titchener & Co. gave to R. C. Neal Company, Inc., Wilson's Elmira, N. Y. Dealer. Working closely with Earl H. Kaeselau, Wilson's New York State representative, K. R. Wilson engineers developed and produced this 100 ton capacity down acting, four column hydraulic press designated Model 100S-FM-2424.

In the development of this press, K. R. Wilson engineers came up with this unique feature — 3" x 24" slide and platen outboards were added which permits the Titchener Co. auxiliary working area where conventional tools can be installed and used without affecting the normal work area of the press. This feature makes the press truly versatile, a real multi-purpose press for a wide variety of uses.

SPECIFICATIONS

This press is available in 25 to 500 ton capacity and can be modified to customer's specific requirements.

If you seek a sure, successful solution to a specialized press problem, follow the lead of America's most progressive companies, contact your nearest K. R. Wilson representative, or write direct today.

HYDRAULICS DIVISION
K. R. WILSON, Inc.
Offices & Factories – 208 Main St., Arcade, N.Y., U.S.A.

TECHNICAL BRIEFS

Scalper Mills Both Billet Sides at Once

Billet scalping time can be drastically reduced through use of a duplex machine that mills both sides of billets at the same time. Based on new concepts of scalping and cutter design, the unit will be used first for producing raw material from which to roll aluminum sheet, strip and foil.

Engineers of Consolidated Machine Tool Div., Farrel-Birmingham Co., Inc., Detroit, designed the machine for installation at the Ravenswood, W. Va., plant of Kaiser Aluminum and Chemical Co. Basic design of the duplex machine can be adapted for scalping almost any ferrous or nonferrous metal.

Saves Time—The scalping unit is equipped with special 75-in. face mills. Made by the Wesson Co., Detroit, these rank among the world's largest preset carbide-blade milling cutters.

Major advantage of the new design is that it saves time during every operation. It can mill both sides of 14-ft, 7-ton billets in a little less than 90 seconds, floor-to-floor.

Less Blade Grinding — Former blade-grinding time of three weeks has been cut to only a few hours with the Wesson preset, inserted-blade cutters. Because the blades are preset, setup time has been reduced to 45 minutes, as contrasted with former setup times of 12 to 15 hours.

In addition to reducing lengthy operations of former methods the duplex machine improves product quality. Since it is unnecessary to flip-flop the billet, there is little chance for damaging milled surfaces. Surface scratches in milled billets can show up as mile-long blemishes in the rolled product. To prevent blemishes, additional milling was frequently required to re-

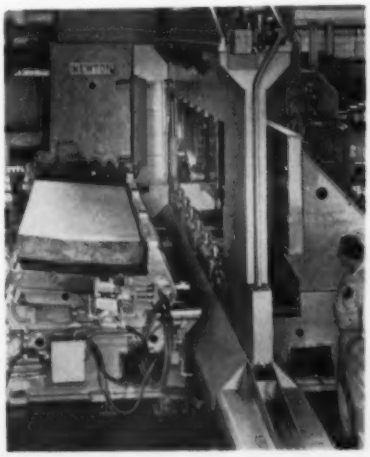
move imperfections in billets scalped on single-spindle machines.

How It Scalps — Rough billets are released, one at a time, from a gravity-feed table to the empty loading leaf. This leaf raises the billet to vertical, slides it forward to a stop and moves it sideways to the fixture. The billet is automatically centralized in the fixture and then clamped. Work points on the top and bottom clamps bite into the edges of the billet and hold it securely.

The fixture and clamped billet are rapidly traversed toward the cutters. If the cutter heads are not far enough apart to admit the billet, the fixture stops. Normally, an operator adjusts the cutter heads, before starting the cycle, to give the desired depth of cut. Just before cutting begins, fixture feed is automatically reduced to a preset, cutting value. At the fixed rotating speed of 600 rpm, cutters have a surface speed of 11,800 sfpm.

Takes Big Bite—About 5/8 in. of scale and "impure" metal is removed from each side of rough billets. At Ravenswood, stock removal rate will be maintained at 5000 cu in. per minute by adjusting feed rate to compensate for changes in depth of cut and billet width. Billets range in size from 8 to 16-in. thick, 30 to 54-in. wide and 6 to 14-ft long.

Mechanical handling is the only way to dispose of the large volume of chips produced. Each cutter operates in a shroud — concentric with and ½ in. away radially— and creates a draft that blows the chips downward. A conveyor, in a pit under the machine, carries chips to a shredder. Another conveyor carries the shredded chips to the disposal area.



Shopworker watches as the unit scalps both sides of an ingot.

Chip Removal—After the billet has passed through the cutters, the fixture is rapidly traversed to the unloading station. At this point, the unloading leaf makes contact with the billet. After the clamps are released, pneumatic pushers tip the billet onto the unloading leaf. This tilts down to the horizontal position. Midway through billet tilt-down, the fixture is signalled to return to the loading station. Billets are mechanically picked off the unloading leaf and transferred to a run-out conveyor.

When required, this machine can be built with provision for scalping

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866

THE WHELAND COMPANY

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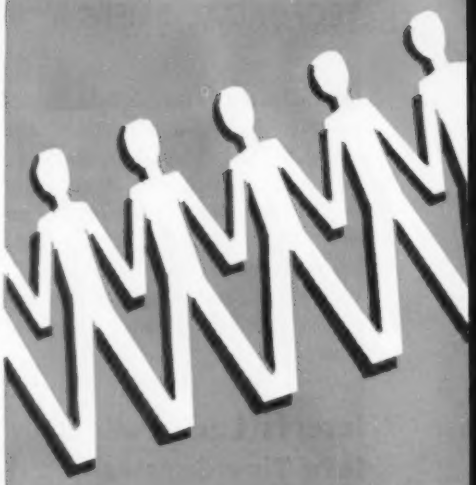

UNIFORMITY

If you've had disappointing variations in monthly control of blast cleaning costs—try Malleabrasive.

Malleabrasive has the uniformity of metallurgical structure from one lot to the next that has leveled out the cost chart line in many of America's largest foundries and other metal working plants. Not only leveled—but lowered!

The full and complete Malleabrasive process itself—used by ourselves exclusively—provides a degree of uniformity unmatched in the metal abrasive field.

Whatever your blast cleaning job, Malleabrasive will do it well, and will repeat uniformly, from month to month. Write us for information.

NOW IN 50 LB. BAGS

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Mansfield, Ohio

Sold by Pangborn Corp., Hagerstown, Md. and by many leading distributors of foundry supplies from coast to coast.

MALLEABRASIVE

two edges of the billet. Edge-scalping heads and cutters are added beyond the present machine. Billets are carried past these heads in the horizontal attitude on an additional table. Additional unloading equipment is also required. With such a setup, neither scalping cycle would interfere with the other.

Inserts Lock Pellets Into Tiny Screws

Nylon-plugged self-locking machine screws as small as 0.050-in. OD are now being manufactured in production quantities. They're being made on a machine specially designed for the job.

The machine overcomes a tough production problem. This is the inserting of nylon pellets into fasteners so small that 200 of them barely fill a thimble. A second machine automatically inserts nylon pellets in nuts.

Output Is High—The screw machine turns out 60 tiny screws a minute. Screws from No. 00 to No. 6 in size are hopper fed to the machine.

These miniature screws have 90 threads to the inch.

In successive steps, the unit rough drills a hole in the threaded portion, finish drills, inserts the nylon pellet, tamps it and then inspects the finished screw.

The nylon pellet, which provides locking action by forcing threads into tight metal-to-metal contact, is itself only 0.018-in. diam and 0.020-in. long.

The Nylok Corp., Paramus, N. J., makes the machines.

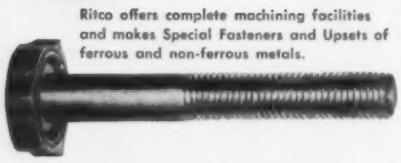
Forkless Fork Trucks Aid Metals Firms

Metalworking firms are accumulating a growing respect for what materials handling men call forkless fork trucks. And that's exactly what they are: fork trucks which substitute special metal-materials and metal-product handling devices in place of more conventional forks.

According to the Hyster Co., Portland, interest in such trucks is growing in the metalworking field. The reason: such special attachments handle the odd-shaped, hard-

IF IT'S A RITCO FORGING

Ritco offers complete machining facilities and makes Special Fasteners and Upsets of ferrous and non-ferrous metals.



IT WILL SAVE YOU MONEY!

Compare and you'll agree that Ritco "Bright Finish" Forgings offer many important production savings. Because they are made to close-tolerance specifications, and have a flawless finish, Ritco Forgings require minimum machining. Their smooth, accurate surfaces speed up assembly, help reduce costs still further. Also, their dense, fibrous structure and controlled grain flow add greater strength and toughness to shock and stress points . . . assure maximum impact resistance and fatigue strength.

It will pay you to write Ritco into your product specifications. Ritco Forgings are produced in a wide range of metals and alloys, and in many designs.

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TRI-STATE ENGINEERING COMPANY

CARGOTAINERS®

PALLETS . . . CONVEYOR GUARD and other Materials Handling Equipment

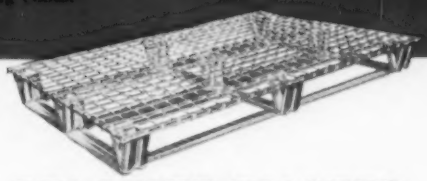
Tri-State materials handling equipment is constructed of heavy gauge steel wire—strong enough to stand up year after year in the hardest service, yet extremely light in weight. Corrosion-resistant, pre-heated vinyl aluminum paint adds long service life. This equipment simplifies the problems of materials handling in a wide variety of applications and produces substantial savings in materials handling costs.

CARGOTAINERS

Cargotainer is Tri-State Engineering Company's registered trade name for the line of containers which the Company has manufactured since 1946. Thousands are now in use throughout industry, providing compact and convenient handling and storage of all types of products, parts, etc. They speed up loading and unloading of materials in shipping.

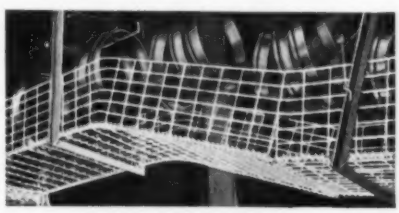
Cargotainers are available in three capacities (1, 2 and 3 ton); in two types of bases (which stack interchangeably); and with a wide variety of optional features such as full or partial drop ends or sides, crane eyes, vertical and horizontal dividers, etc.

All types are collapsible, for space-saving storage and shipping when not in use. Standard sizes: 32" x 40" x 24"; 32" x 40" x 28" (3,000 lb. cap.); 36" x 46" x 24"; 40" x 48" x 24"; and 48" x 48" x 24".



TRI-STATE PALLETS

Strong, lightweight, fire-resistant, and self-cleaning, Tri-State Pallets offer the further advantage of eight-way accessibility. Their unusual base design permits fork entry at corners, as well as at sides, and ends. Trucks can place them in exactly the position desired or pick them up from any position even in congested areas.



TRI-STATE CONVEYOR GUARD

Follows your conveyor line exactly, along rises or dips, and around corners. Engineered in sections for easy installation—which is made still easier by the light weight of the wire construction. Available in various mesh sizes, according to the material conveyed. Just send us a blue print of your overhead conveyor line, and we will be glad to give full details.

CARGOTAINER DIVISION

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MEMBER

TRI-STATE ENGINEERING COMPANY

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Washington, Pennsylvania

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anti-rust preventives protect Helicopters

SIKORSKY—12 passenger—2-man crew

Sikorsky Aircraft uses Tectyl compounds

High-speed aircraft bearings are precision ground to exacting tolerances for maximum anti-friction performance. Protection of their satin-sheen surface is a *must!*

Bearings are protected at Sikorsky by first dipping them in Tectyl compound #867 (film-thickness .0002 in.) to remove finger prints. Acid content of a smudge can cause corrosion. A second operation applies Tectyl #437 (film-thickness .0015 in.) preserving the surface indefinitely prior to installation. An additional Valvoline Tectyl product #506 (film-thickness 0.004 in.) a solvent cut-back compound, is sprayed on production jigs and fixtures before storage.

Why Tectyl Is Used . . Metal acid salts react with moisture to form corrosion. Deterioration of metal can be prevented by dipping or spraying the surface with protective petroleum-base chemical coatings. Valvoline produces a broad line of water-thin coatings for every type of rust-preventive need. Insure high dollar parts and equipment investments with TECTYL Compounds. Write Tectyl Division, Valvoline Oil Company TODAY! Dept. IA-358.

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Division of ASHLAND OIL & REFINING COMPANY

to-move loads so frequently found in shops, plants and warehouses.

Zip, On; Zip, Off—Of particular value to job shops and warehouses that do not always handle only the same items over and over again is the fact that many of these special devices can be mounted or demounted in a matter of minutes. This lets trucks tackle standard jobs

Truck lifts 200°F part from furnace; turns it end-for-end.

and then quickly switch over to do special ones. Hydraulic attachments are available to grab, roll, tilt or squeeze loads.

In one application, C. F. Braun Co., Alhambra, Calif., uses a regular fork truck with special attachments in its making of heat exchangers. Employing a regular Hyster truck, it picks up 200°F components as easy as a conventional setup moves a pallet. It turns the part end-for-end and eases it back into place.

Installs Big Valves

Two of the largest butterfly valves ever used in steel mill service are being installed in the basic oxygen furnace process in the Aliquippa Works of Jones & Laughlin Steel Corp.

Measuring 8-ft 6-in. ID, the valves were fabricated by Blaw-Knox Co.'s equipment division under contract to Kaiser Engineers, de-

signers and constructors of the steel firm's expansion project.

Forming a part of the electrostatic precipitator circuit of the dust collection and gas cleaning system, the valves will handle 235,000 cfm

One of a pair, this valve will handle gas at 235,000-cfm.

of gas at 500°F. Water cooling will be used to protect the units rather than the conventional refractory lining. The disks will be operated through pneumatic controllers.

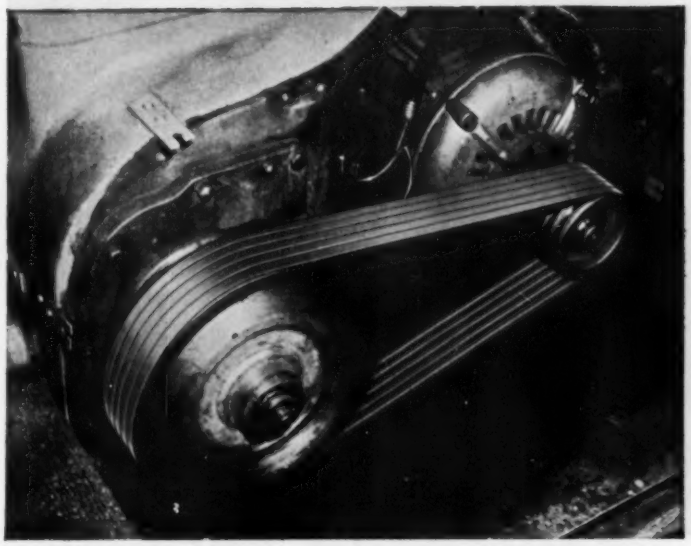
Aluminum Diecasting Alloy Is Strong

Boasting built-in structural and bearing strength is a new aluminum diecasting alloy. It has a reported 1500-psi strength; this makes it of value where users want integral bearing surfaces instead of cast-in or specially assembled bearings or bushings.

Dubbed Alloy X385 by its developer, Aluminum Co. of America, Pittsburgh, it's the result of a three-year research and development program. The alloy's ability to withstand 1500-psi loads compares with alloy 380's 900-psi limit. However, the latter, long a standard for light bearing applications, still remains the choice for loads up to 900 psi.

Make Rods of It—First commercial application of the alloy is in connecting rods for air-conditioning compressors. Further heavy bearing applications appear to be connecting rods for refrigerator compressors and outboard motors, washing ma-

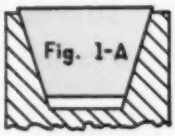
CONCAVE SIDES make V-belts last longer



***See for yourself* why the concave sides (Fig. 1) of a Gates V-Belt greatly lengthen its life. Just do this:**

Bend a Gates belt and feel the sides. Note how these precisely engineered concave sides *fill out* on the bend and *become straight*. Thus a Gates belt grips the sheave groove evenly (Fig. 1-A) and wear is distributed uniformly across each side of the belt. That means longer belt life; lower costs.

Fig. 1



Make the same test with a straight-sided belt (Fig. 2) and see what happens. The sides bulge out on the bend (Fig. 2-A) concentrating the wear at points shown by arrows.

Fig. 2

For longer belt life...lower belt costs, specify the V-belt with Concave sides—Gates Vulco Rope...readily available from nearby distributor stocks.

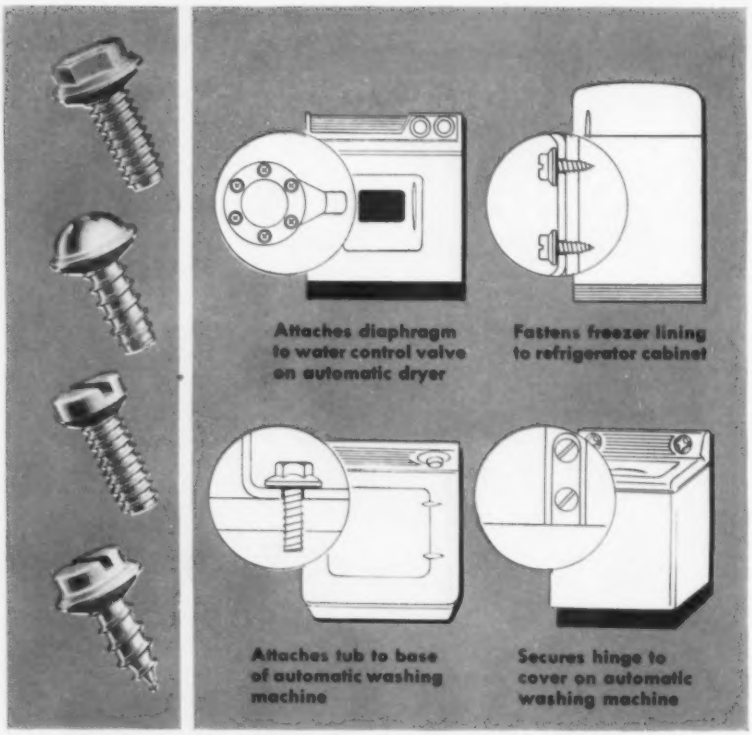
World's Largest Maker of V-Belts

The Gates Rubber Company

DENVER, COLORADO

There are Gates Engineering Offices and Distributor Stocks in all industrial centers of the United States and in 70 other countries throughout the world.

Gates VULCO ROPE Drives


Attaches diaphragm to water control valve on automatic dryer
Fastens freezer lining to refrigerator cabinet
Attaches tub to base of automatic washing machine
Secures hinge to cover on automatic washing machine

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Offer Appliance Manufacturers Lower Costs and Superior Performance

Leading appliance manufacturers are cutting production costs and improving their products by adopting Townsend Tuff-Tite fasteners. The one-piece head and washer construction of Tuff-Tites eliminates a major source of leakage. The additional pre-assembled neoprene washer not only serves to eliminate leakage, but also protects porcelain enamel surfaces from scratches and mars. Since they are resistant to vibration Tuff-Tites have any number of applications in the appliance field.

If you have a fastening problem, Townsend specialists will be glad to make recommendations as to the proper Tuff-Tite to meet your needs. If a standard item cannot be used, Townsend engineers will design a custom-made fastener to answer your purpose.

For complete information, write to Townsend Company, P.O. Box 237B, New Brighton, Pennsylvania.

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chine and dryer gear housings, electrical hand tool parts and other mechanical appliances.

Alcoa reports the new metal will prolong connecting rod life substantially, eliminating a frequent cause of appliance failure.

Uses Tin, Lead—Tin, lead and cadmium in the alloy provide a combination of good casting characteristics, mechanical properties and bearing qualities. These elements help improve machining characteristics, too. Previous aluminum alloys for heavy bearing applications have shown poor castability and strength in die casting, Alcoa points out.

Tensile strength and yield strength on a typical specimen are 36,000 and 20,000 psi, respectively.

Titanium Racks Cut Anodizing Costs

Before turning to racks of commercially pure titanium, racks used in anodizing aluminum automotive parts lasted only 6 days at Reynolds Metals Co., Louisville, Ky. Rack replacement costs were high. So was downtime.

By making rack tips or holding fixtures of commercially pure titanium, these factors have both been drastically reduced. Average rack life is now 120 days.

Uses Automatic Setup—Anodizing operations at the plant are done automatically and on a large scale. Car window frames, grilles, hood moldings and headlight assemblies are rack-mounted. They are dipped into a brightener solution, then into an electrolytic bath.

Problems were caused mainly by the brightener. This is a solution of highly concentrated sulfuric and phosphoric acid.

Basic Racks Are Aluminum—For economy in construction of the racks, the basic racks are made of aluminum and then rubber coated.

One rack design has holding fixtures made of 0.071-gage titanium sheet. These are 1½-in. wide by 4-in. long. Strip is riveted or bolted into place on an aluminum holder.

The possibility of titanium's use for spline and stamped metal finger types of racks is now being considered by Reynolds engineers and representatives of Mallory Sharon Metals Corp., titanium producer.

Develops Gallium Recovery Process

A new process for recovering gallium has been developed. It consists of treating sub-divided ore containing the metallic element with a current of hydrogen chloride or hydrogen bromide. This is done under substantially anhydrous conditions at a temperature ranging from 700 to 950°C.

The method's developer, Dow Chemical Co., Midland, Mich., says it believes the new process will make possible the extraction of substantial quantities of pure gallium metal from ores.

Material Is Less Common—The element occurs widely but in minute amounts and is remarkable for its low melting point, 29.7°C. Aluminum ore is a major source of the material.

The commercial potentialities of gallium have not been developed as yet. However, it has possible uses in the electronics field and as an amalgamating agent in place of mercury, the company says.

Automation Can't Do All Jobs

Getting down to the last "hair" in tolerance in some cases is still no job for automation. Take the skilled workers at Bronson & Bratton Inc., Chicago, for instance. They must use hand-operated profilers to put the finishing touches on 35-lb carbide die inserts.

The skilled profilers have to use all the tricks in a die maker's book to get the insert's three-dimensional irregular contours to this stage. Such carbide inserts, specially formed by General Electric Co.'s metallurgical products department, Detroit, are for 280-lb draw dies which form automotive parts.

Skilled craftsman puts finish touches on a carbide die part.

Matheson Gas Mixtures

for KAISER ALUMINUM'S NEW QUALIWELD

MIG* Welding Process

Matheson's special Chlorine-Inert gas mixtures eliminate porosity in heavy plate welding of Aluminum or Magnesium Alloys, where more than one pass is needed. Matheson's corrosion-resistant pressure regulators are especially recommended for use with these gases to insure steady, trouble-free operation.

97% Argon, 3% Chlorine—for flat welding
97% Helium, 3% Chlorine—for vertical and overhead welding

*For further information on gas mixtures for Metal Inert Gas welding contact Sales Engineering Dept., The Matheson Co., Inc., P.O. Box 85, East Rutherford, N. J. Matheson offers 76 compressed gases, pressure regulators, valves and accessories. Prompt shipment from 3 plants.

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TECHNICAL BRIEFS

Thin Aluminum Oxide Films Aid Research

Extremely thin layers of aluminum oxide are aiding research scientists looking into the basic properties of matter. This oxide is derived from aluminum foil.

Now being used in studies at Westinghouse Research Laboratories, Pittsburgh, the very thin layers of oxide are obtained by chemically dissolving away all the aluminum metal (about 0.001-in. thick). This does away with about 99.9 pct of the original material, leaving an oxide coating of less than a millionth of an inch thickness.

May Give New Data—Scientists employing the films in research on basic properties of matter point out that new scientific knowledge often emerges when matter is studied under extreme conditions. In films, solid matter exists under an extreme. This is the almost complete absence of thickness.

Westinghouse engineers also find the very thin aluminum oxide coating useful in electronic devices (eletronic imaging tubes, etc.).

Units Cold-Form Intricate Parts

Although cold heading dates back to before the Civil War, the advanced development of the process and what it can accomplish is relatively unfamiliar to some designers and engineers. Powerful heading machines, long life carbide dies, and quality-controlled raw materials enable economical volume production of thousands of parts. This is a far cry from the simple forms sometimes associated with cold heading. Take, for example, the many intricate items which may be made on the "nail machine."

According to cold-heading machine maker John Hassall, Inc., Westbury, N. Y. such "complicated" cold-headed articles include items having both "heads" and "collars". Among those having heads are standard nails, identification nails with letters formed in their heads, hobby-size railroad spikes, nails made from square and rectangular wire stock, nails having special points (i.e., needle point), and nails having special purpose heads.

Some Have Collars—Among the items having collars are stud-gun nails, electronic wiring posts which are driven into harness board up to their collars, pegs for toy tops, and nails to which components are secured by riveting the section of the shank above the collar.

Also included are several items made on nail machines and given secondary operations. Threaded nails and ski-pole points are in this category. Parts often are made from steel, copper and copper alloys, and aluminum. A wide range of sizes can be cold headed.

How Upsetting Goes—In making

PUNCHES · DIES · RIVET SETS
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Made to highest standard and uniform quality thus insuring maximum service.

Since 1903

Rivet sets—round, square, oblong Punches, and Dies carried in stock.

Write Dept. B for catalog 54 and new stock list.

GEO. F. MARCHANT COMPANY
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parts on nail machines, reel-mounted wire stock feeds into a cylindrical opening formed by semi-cylindrical grooves in mating die blocks. The wire comes to rest with the leading end projecting beyond the ends of these gripping dies. The dies close, clamping the wire; a heading punch strikes the protruding end, forcing the metal into the desired head shape.

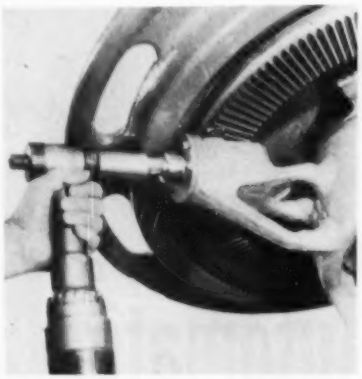
The punch retracks; gripping dies open. The wire moves forward and is pinched off. Dies close again; the forming punch strikes, and the cycle repeats. Points of nails are formed in cut-off operations. The process takes place very rapidly. Hundreds of parts can be produced per minute.

In this manner heads and collars of thousands of sizes and shapes can be formed on a wide variety of metals to close commercial tolerances. Secondary operations, such as roll threading, machining and plating can adapt the nail-machine product for many made-to-order applications.

Pneumatic System Works Valves Fast

Large, high-pressure valves can be quickly and easily operated by one man making use of a new development. Using it, a 10-in. 2500-lb valve under pressure can be easily closed down by one man in 2½ minutes from full open to seat contact. Final tight shutoff is then achieved by the hammer-blow action of the device's handwheel.

The device is a ring gear and pinion assembly fastened to a handwheel and valve yoke. A portable air motor, operating from 90-



This air wrench opens and closes the valve with ease.

psi plant compressed air supply, turns the pinion gear and handwheel. The unit is available for operation of any of the maker's 10, 12, 14 or 16-in. valves of 900-lb or higher pressure series.

Principal advantage of the setup is that it enables one man to open or run large valves where a crew of two to five men would otherwise be necessary. As pressures and valve sizes continue to go higher, many more valves are installed that require more than one man to operate.

Edward Valves, Inc., a subsidiary of Rockwell Mfg. Co., Pittsburgh, makes the air-actuated impact gear valve setup.

Suit Protects Wearer

A new aluminized asbestos fire suit offers full protection to the

WARD STEEL CO.

PROMPT WAREHOUSE SERVICE ONLY

Most Complete Stock in America of

BLUE TEMPERED SPRING STEEL

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Is your plant CRITICALLY SHORT of WATER?

You will make major water savings, reduce your costs, solve your problems of water supply or disposal and get HIGH OPERATIONAL EFFICIENCY with Niagara "Aero" Evaporative Heat Exchangers, After Coolers or Condensers for these important plant services or processes:

- AFTER COOLING and air drying for large air and gas compressors and AIR LIQUEFACTION
- COOLING ENGINES, COMPRESSORS, HYDRAULIC PRESSES
- COOLING QUENCH BATHS, FURNACES, INERT ATMOSPHERES
- COOLING ROLLS, WELDERS, DRAWING OR EXTRUSION DIES
- PRODUCT AND PROCESS COOLING CHEMICALS OR INTERMEDIATES
- COOLING LIQUIDS OR GASES IN CLOSED SYSTEMS
- VAPOR CONDENSING UNDER VACUUM
- ELECTRONIC PROCESS COOLING

High operational efficiency means: precise temperature for improved product and process quality control, heat removal at rate of input, simple operating conditions, real economy in upkeep, sustained full capacity.

Also it means cooling in a closed system with your product kept free from contamination or, when condensing, getting a pure condensate holding high quality in your product or material.

Niagara machines do the work of a cooling tower plus shell-and-tube coolers with a single machine that saves piping, water handling disposal and treatment expense and 95% of water consumed by contact cooling methods.

Write for Bulletin 129, 130, 132, 136R.

NIAGARA BLOWER COMPANY

Over 35 years of Service in Industrial Air Engineering

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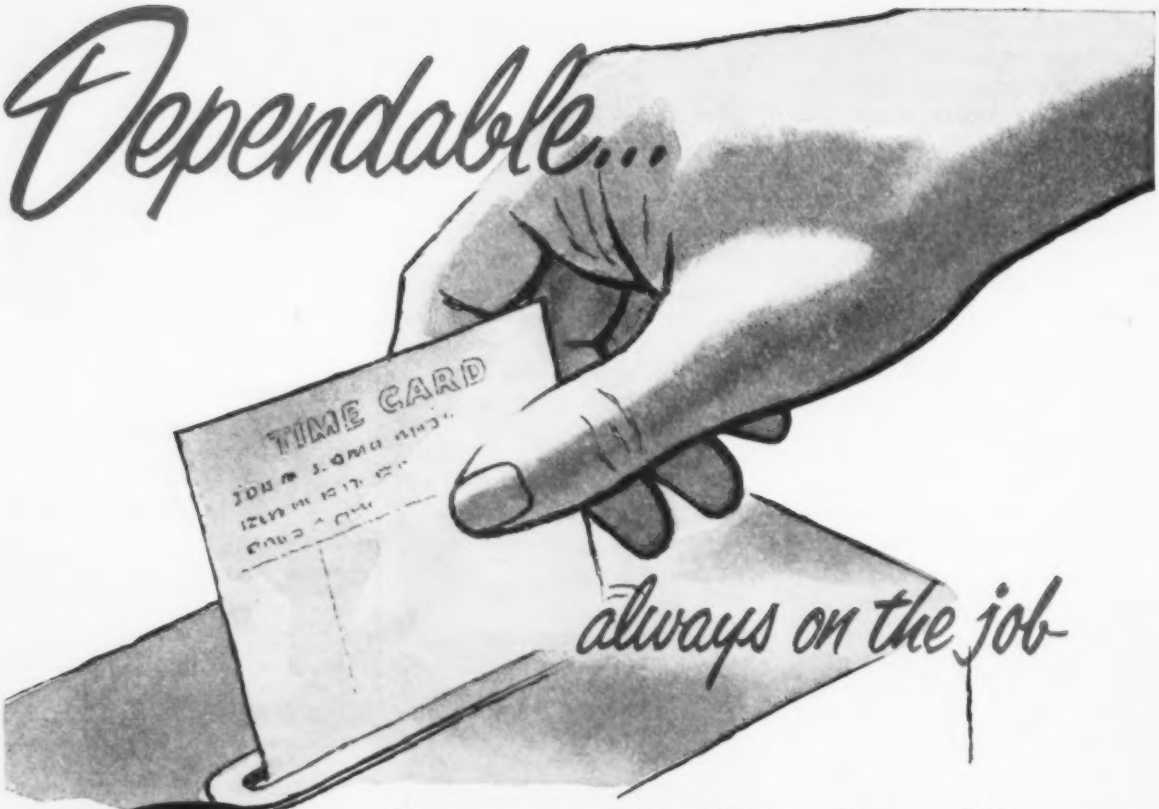
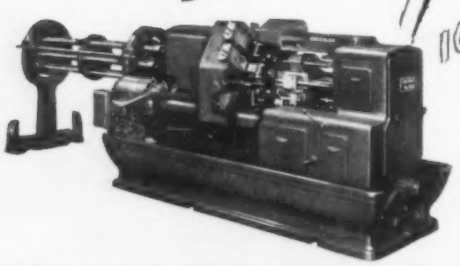


PRODUCTION MACHINERY

GREENLEE Automatic Bar Machines



SIX AND FOUR-SPINDLE AUTOMATIC BAR MACHINES

GREENLEE Special Machine Tools

- Multiple-Spindle Drilling and Tapping Machines
- Transfer-Type Processing Machines
- Hydro-Borer Precision Boring Machines

BOOST PRODUCTION REDUCE DOWN TIME

It's easy to maintain rigid production schedules . . . prevent costly bottlenecks with Greenlee Bar Automatics. They are always on the job . . . give continuous, reliable service.

You hear much comment about Greenlees' uninterrupted, round-the-clock performance in widely different industries. With good reason, too, for Greenlee offers years of manufacturing experience... plus manufacturing integrity not often duplicated.

Want complete information? Call in the Greenlee man. Let him give you the complete story. Please submit a print when inquiring about a specific job.

WRITE FOR CATALOG No. A-405

GREENLEE BROS. & CO.

1803 MASON AVENUE
ROCKFORD, ILLINOIS

... Results of a Superior Beginning

The countless parts and products made from Roebling high-carbon steel spring wire and flat spring steel have one thing in common . . . their superior quality. This, of course, is related to the inherent fineness of the materials.

The variety in which Roebling offers these spring materials is equally impressive. They are available in hard drawn, hard rolled, annealed or soft, tempered or untempered. Types include zigzag and no-sag wires; upholstery and mechanical spring wires; valve spring wire; clock- and motor-type spring steels and flat spring steels of all types and description.

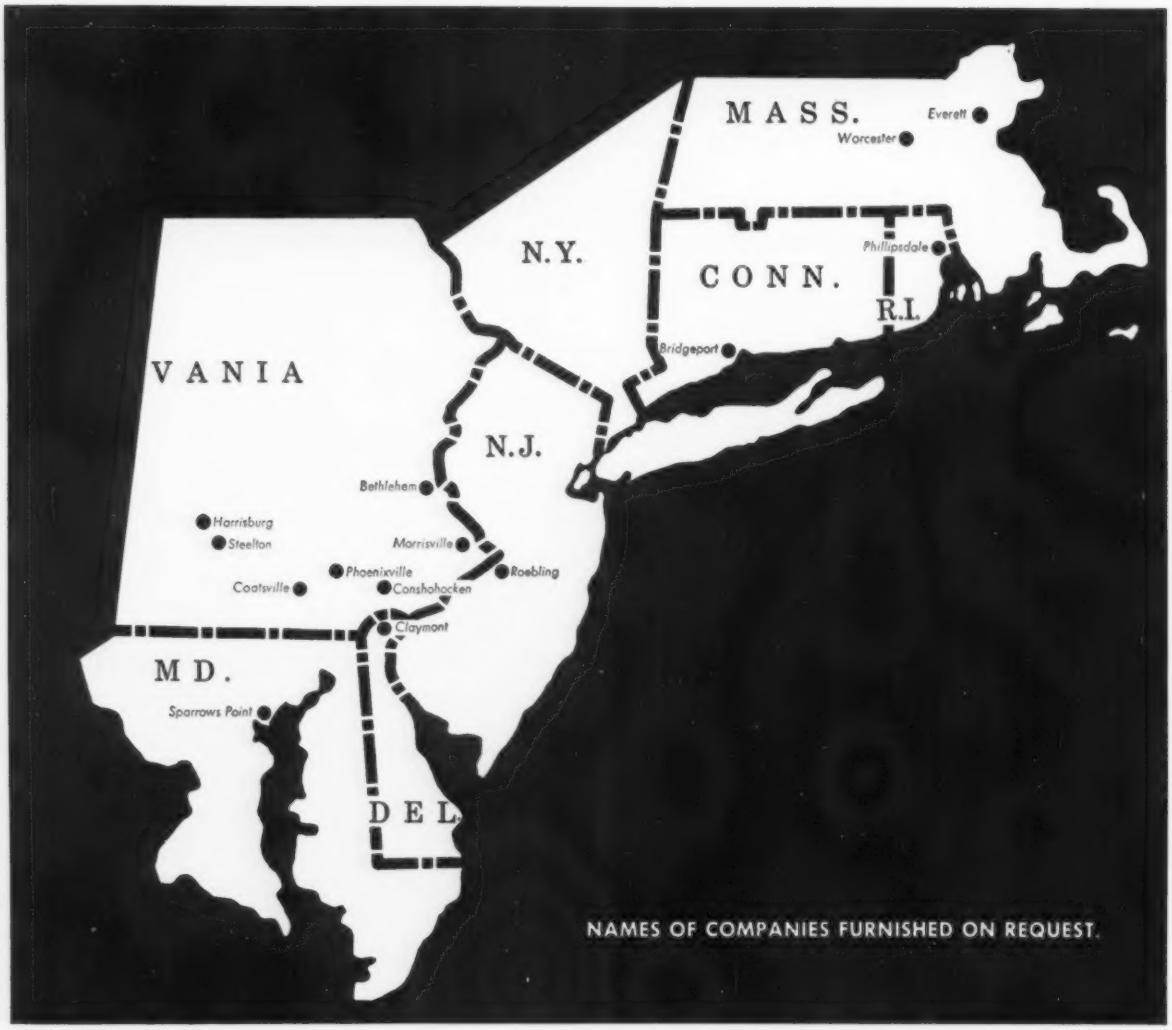
Whatever the type, size or characteristics you require—Roebling can fit your needs exactly. You'll find that Roebling quality means maximum production from your machines and consistent uniformity in your product.

For spring wire and flat spring steel information, contact Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities—Subsidiary of The Colorado Fuel and Iron Corporation

Roebling... Your Product is Better for it



Permanente #165 was chosen for 74 out of the last 90 rammed furnace bottoms installed in this area! Reasons: longer life, fewer repairs, less down time ... advantages pioneered by—

For complete information,
ask for valuable installation manual "Permanente 165 and 84 Ramming Mixes for Open Hearth Furnaces."

Call or write Kaiser Chemicals Division, Dept. S-8113, Kaiser Aluminum & Chemical Sales, Inc., at any of the regional offices listed below:

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PIONEERS IN MODERN BASIC REFRACTORIES
REFRACTORY BRICK AND RAMMING MATERIALS • CASTABLES & MORTARS
MAGNESITE • PERICLASE • DEADBURNED DOLOMITE • ALUMINAS

wearer, even in direct flame. Consisting of a helmet, jacket, trousers, shoes, mittens and carrying case totaling 23 lb, it's extremely pliable. Average donning time is less than two minutes. Constructed with two basic inner linings of neoprene treated fiberglas cloth to serve as

Suit's wearer walks through oil flames without discomfort.

vapor barrier, the suit also features a one-inch layer of fiberglas insulation bonded to aluminum foil, plus an outer layer of aluminized asbestos. It has been tested in actual use at temperatures over 2000°F for four-minute periods in jet fuel, hydraulic fluid, lacquer thinners, dope and other flammable liquids.

The protective suit is being made commercially available by Safety Clothing & Equipment Co., Cleveland.

Travels Road, Rails

A new vehicle's unique design permits it to run on either road or rail. Successful though earlier models were, its manufacturer, Whiting Corp., Harvey, Ill., has found that many plants need greater pulling power to move heavier loads.

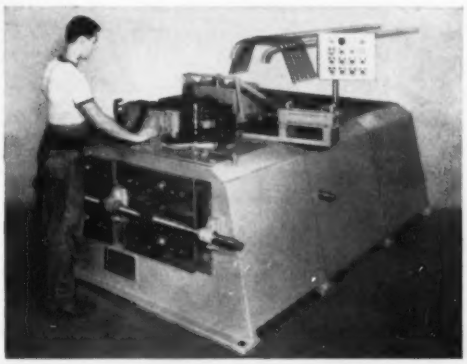
To meet this demand, engineers developed a larger, more powerful unit. It has a number of important design innovations not found on the original model. And it moves substantially larger loads. Development of this torque converter equipped unit stems directly from industrial requests for improved performance and greater ease of handling in this machine. Besides incorporating all the features found in the previous models, the torque converter unit is equipped with an all-new power train which includes a new engine and a torque converter-hydraulic transmission combination.

Toolholder Ups Output

A new throwaway-type carbide tool holder reduces production interruptions for changing the insert cutting edge or depth of cut. The holder incorporates a spring-loaded pin which automatically lifts and holds the chip breaker against clamp when changing or indexing the insert. Its solid carbide chip breaker has three fixed positions. These adapt it to light, medium or heavy cuts. It's adjusted to suit a cut by simply pushing it into position with the end of a wrench.

Coromat Div., Sandvik Steel, Inc., makes it.

Tubular chair legs are produced at a rate of 1,440 pieces per hr on this Hill machine. Production savings in less than six months justified the machine purchase price.



HILL AUTOMATED MACHINES COMBINE PUNCH PRESS AND BENDING OPERATIONS

Now you can achieve significant production savings on tubular parts by combining punch press and bending operations on Hill fully-automated machines. Piercing, countersinking and flattening operations, as well as coining of weld projections can be combined with multiple bending in a single, versatile, high-speed machine.

These new horizontal punch press and multiple bending combination machines utilize unique press bending principles and hydraulic power systems to produce up to two and more parts at a time. They are ideally adapted to the production of tubular furniture, automotive and aircraft molding and trim, and will also handle angle, square or rectangular-section shapes.

If you produce 50 or 50,000 pieces a day, it will pay you to investigate Hill advanced designs. Send part specifications and production requirements for prompt quotations on cost-saving equipment.

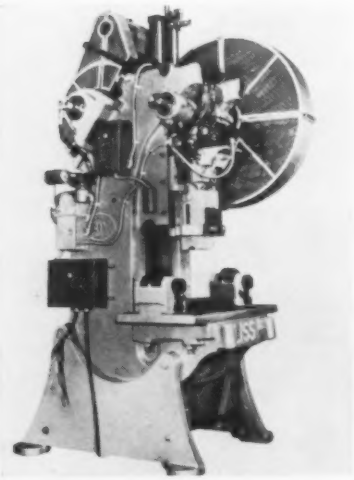
Write for this catalog giving complete information on Hill specialized hydraulic bending machines, double-end machines and extrusion equipment.

WALTER P. HILL, INC.

22183 Telegraph Road • Detroit 19, Michigan

New Production Ideas

Equipment, Methods and Services



Standard Inclinable Press Straightens Pipe

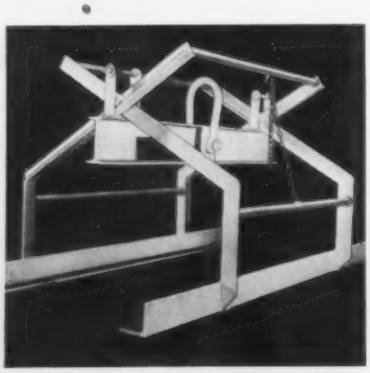
Especially designed for pipe straightening operations is this unique press setup. Making use of a standard inclinable press, designers adapted it for this unusual application. The press is equipped with support rolls, a special frame and a type "K" clutch. Using an air counterbalanced slide with motorized adjustment, the press adaption is operated by a foot switch on a "jog" type of operation. On the same floor plate there are two additional foot switches to raise or lower the slide. Thus, the operator can adjust it from whatever position he is working. In this special application, a set of rolls is furnished with the press to handle from 1.66 to 4.5-in. diam pipe. To accommodate various size bends, the roll brackets may be moved in or out of the full width of the table. This particular pipe-straightening adapted press was recently custom designed for a major West Coast steel company. (E. W. Bliss Co.)

For more data circle No. 45 on postcard, p. 152

Wire Dispenser Cuts Hazards of Handling

This tie wire reel-type dispenser eliminates coil-over shoulder wire tying. For such wire tying applications as reinforcing bars, metal lathing, pipe insulation, plant maintenance, shipping rooms, etc., the dispenser is worn on the worker's belt. Its design permits either right-hand or left-hand use. The unit contains a wire filler that is reeled out as it's used. When depleted, the wire filler can be replaced within a few seconds. Key features of the product are: (1) It eliminates dangers associated with wire tying with a coil of wire slung over the shoulder; (2) It significantly speeds wire tying operations. Field tests indicate that the reel permits 6 to 8 more ties per man per minute compared to some other methods. Another advantage claimed by its maker for the dispenser is cutting of waste by 33⅓ pct. (Ideal Reel Co.)

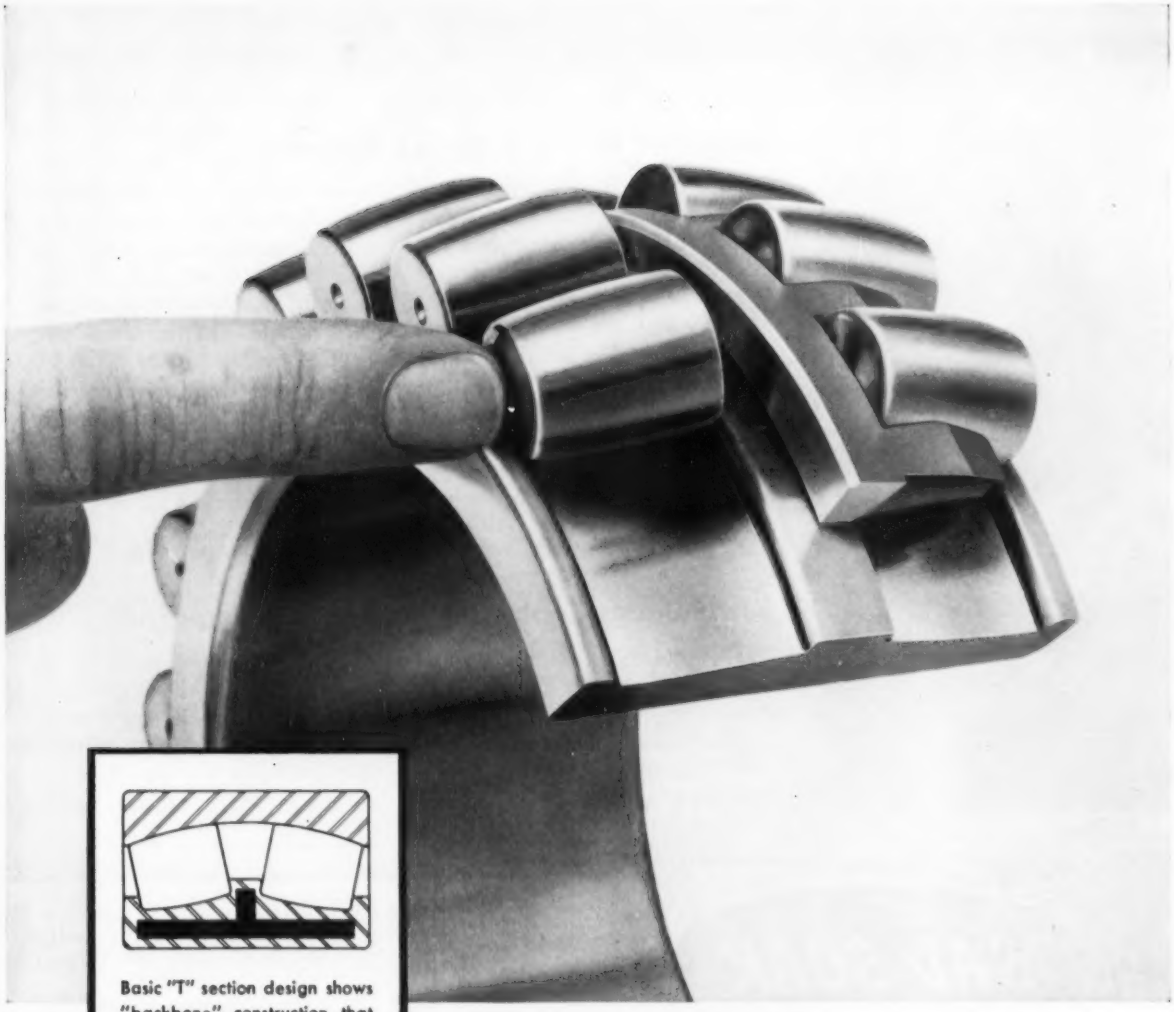
For more data circle No. 46 on postcard, p. 152



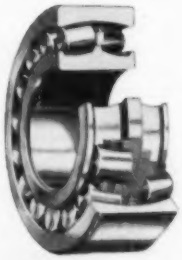
Non-automatic Tongs Safely Haul Sheet Steel

Sheet steel in packs from 18 in. to 42 in. wide and up to 16 in. deep can be handled safely with new non-automatic tongs. They are available from stock in 5, 6, 7 and 9-ft lengths. Capacities range from 2 to 5 tons. Of a simple but effective design, the tongs are intended for applications where the amount of lifting is limited and an inexpensive lifter is adequate. A chain at one side keeps the lifter open when it is being lowered over a pack of sheets. When this chain is dropped out, the lifter closes on the load, holding it firmly while lifting. When the load is delivered the chain is used to lock the lifter open again. Distance from the bail to the bottom of the tongs is 35 in. (Heppenstall Co.)

For more data circle No. 47 on postcard, p. 152



Basic "T" section design shows "backbone" construction that insures positive roller guidance and stability without skewing under all load conditions.



For roller stability...

there's nothing like "the bearing with the backbone"

The only *positive* way to guide rollers is by an integral center guide flange—backbone of the *Torrington* Spherical Roller Bearing. No floating ring can match it for stability under heavy radial and thrust loads.

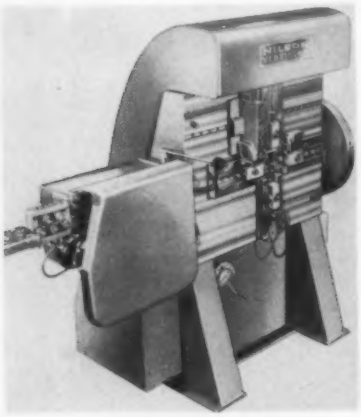
This "bearing with the backbone" insures true rolling motion . . . prevents stress concentration . . . means minimum friction. It makes possible open-end cage design, too, with no shrouds to impede circulation of lubricant to bearing contact surfaces. There is less heating and more positive lubrication.

The integral center guide flange is adapted from the same principle used in the design of Torrington Tapered Roller Bearings. This refinement is typical of Torrington's uncompromising engineering that assures you the ultimate in bearing performance. **The Torrington Company, South Bend 21, Ind.—and Torrington, Conn.**

TORRINGTON BEARINGS

District Offices and Distributors in Principal Cities of United States and Canada

SPHERICAL ROLLER • TAPERED ROLLER • CYLINDRICAL ROLLER • NEEDLE • BALL • NEEDLE ROLLERS • THRUST



Versatile Machine Forms Ribbon or Wire

Capable of handling both wire and ribbon metal stock, this general purpose forming machine automatically produces a wide variety of formed parts to close tolerances at high speeds. The four-slide unit does its forming in a vertical rather than a horizontal plane. Departing from more conventional means of actuating the forming slides, this design incorporates a drive shaft located behind the face of the machine. Forming slide rolls have needle bearings and are placed in the center of the slides. This affords a centralized thrust from low-angle barrel cams mounted rigidly in the frame to completely eliminate shaft spring. The unit takes metal in coil form and directly straightens, feeds, cuts-off, and forms it into a product. Such operations eliminate secondary work in many cases. It takes to 0.187-in. diam wire. (A. T. Nilson Machine Co.)

For more data circle No. 48 on postcard, p. 152

Kit Includes Tools For Cutting, Flaring Pipe

This tube cutter and flaring tool set includes a tube cutter, an extra cutter wheel and a flaring tool with a compressor attachment. These tools, packaged in a steel case, provide quick, efficient cutting and flaring work on copper, brass and aluminum tubing. They'll handle: 3/16, ¼, 5/16, ⅜, 7/16, ½ and ⅝-in. diameters. (J. H. Williams & Co.)

For more data circle No. 49 on postcard, p. 152

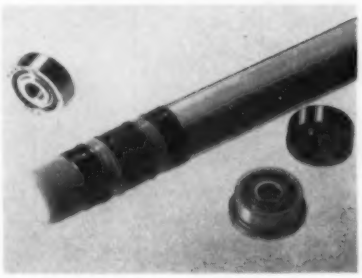
SAD SOAK TANK TALE
...WITH A HAPPY ENDING
BILL*, I'VE CALLED YOU IN BECAUSE I'VE GOT TO CUT CLEANING COSTS ON THE ALUMINUM SHEETS, CASTINGS AND EXTRUSIONS WE PREPARE FOR ANODIZING.
OK BY ME, KEN. PUTTING THE AXE TO A CUSTOMER'S COSTS IS A PENNSALT SPECIALTY. WHAT'S YOUR PROBLEM?
*BILL WILSON, PENNSALT REPRESENTATIVE
NOT WHEN YOU USE PENNSALT A-28. IT'S AN ANHYDROUS POWDERED ALKALINE CLEANER THAT'S SPECIALLY INHIBITED TO PREVENT ATTACK ON ALUMINUM. AND A-28 DOES A GREAT JOB OF REMOVING RED AND BLACK MARKING INKS, FINGER MARKS AND SHOP SOILS.
LATER THE SAME WEEK
I WOULDN'T BELIEVE IT IF I HADN'T SEEN IT WITH MY OWN EYES. WE'VE COMPLETELY ELIMINATED HAND WIPING. EVERYBODY HERE IS PLEASED AS PUNCH WITH THE RESULTS.

Mechanized Welder Allows Manual Arc Guiding

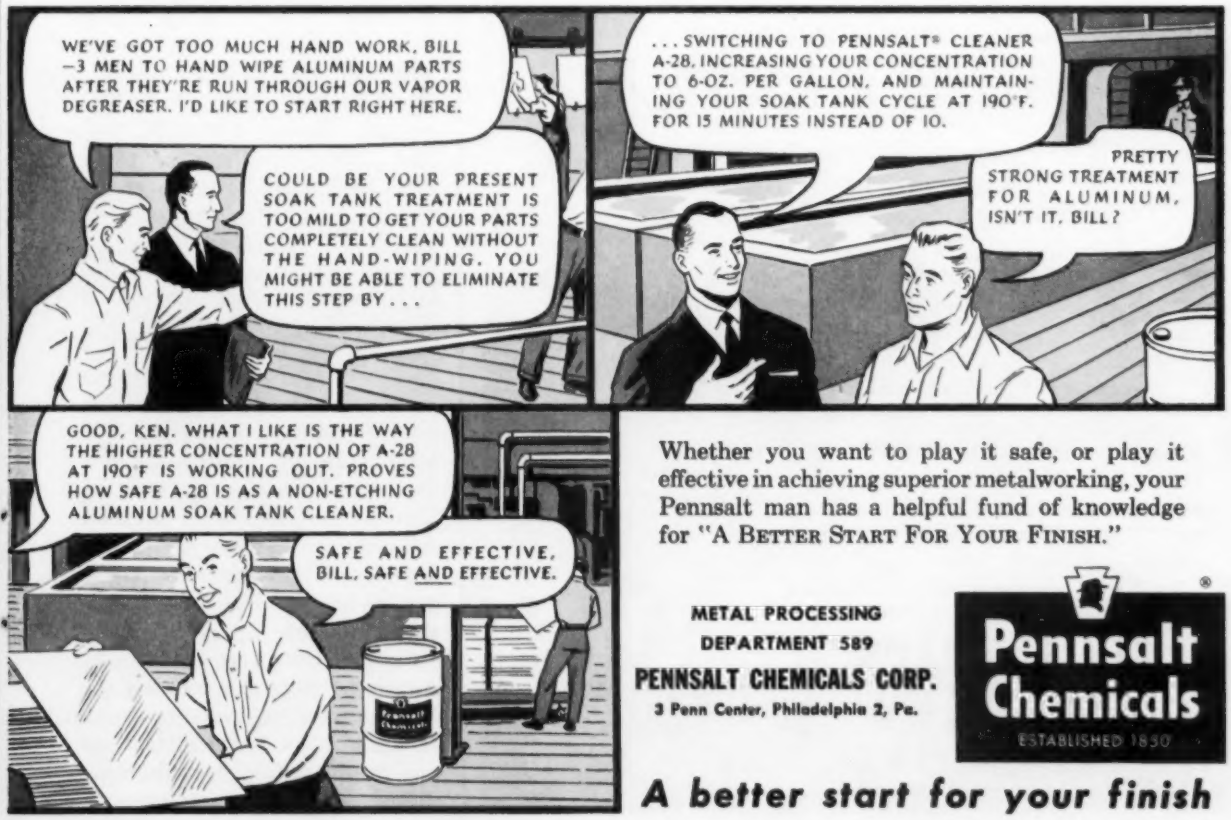
Using the submerged arc process, a new type mechanized welding machine quickly, economically and uniformly welds jobs which previously were difficult to do by the process. Providing automatic wire feed, flux flow and travel speed, it permits manual guiding of the welding arc. The unit feeds a continuous wire electrode from a coil to a compact hand-held gun. This gun is held against a joint along which it's propelled at a preset speed by a small motor. A low pressure air system flows flux from a large tank to the gun. From the gun it drops to completely cover the arc at all times. Yet, the flux doesn't flow ahead of the arc (which might make it difficult to see the seam). Features of the new machine are intended to improve the application of the submerged arc process, says the unit's maker. It can reduce the cost of welding some jobs by hand with conventional coated electrodes. (Lincoln Electric Co.)

For more data circle No. 50 on postcard, p. 152

Tiny Bearings Are Made of 440-C Stainless



Miniature ball bearings recently introduced are made entirely of vacuum-melt 440-C stainless steel. The tiny bearings are almost perfectly finished and resistant to in-service corrosion. Entirely new manufacturing facilities are being used to turn, grind, heat-treat and finish the miniature ball bearings. According to their manufacturer, the combination of vacuum-melt stainless steel and use of new centerless-type internal and external grinding machines enables the company to produce perfect "race geometry." This, in combination with mirror-


WE'VE GOT TOO MUCH HAND WORK, BILL —3 MEN TO HAND WIPE ALUMINUM PARTS AFTER THEY'RE RUN THROUGH OUR VAPOR DEGREASER. I'D LIKE TO START RIGHT HERE.
COULD BE YOUR PRESENT SOAK TANK TREATMENT IS TOO MILD TO GET YOUR PARTS COMPLETELY CLEAN WITHOUT THE HAND-WIPING. YOU MIGHT BE ABLE TO ELIMINATE THIS STEP BY . . .
. . . SWITCHING TO PENNSALT® CLEANER A-28, INCREASING YOUR CONCENTRATION TO 6-OZ. PER GALLON, AND MAINTAINING YOUR SOAK TANK CYCLE AT 190°F. FOR 15 MINUTES INSTEAD OF 10.
PRETTY STRONG TREATMENT FOR ALUMINUM, ISN'T IT, BILL?
GOOD, KEN. WHAT I LIKE IS THE WAY THE HIGHER CONCENTRATION OF A-28 AT 190°F IS WORKING OUT. PROVES HOW SAFE A-28 IS AS A NON-ETCHING ALUMINUM SOAK TANK CLEANER.
SAFE AND EFFECTIVE, BILL. SAFE AND EFFECTIVE.

Whether you want to play it safe, or play it effective in achieving superior metalworking, your Pennsalt man has a helpful fund of knowledge for "A Better Start For Your Finish."

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Pennsalt Chemicals
ESTABLISHED 1850

A better start for your finish

Putting Teeth into YOUR gear drives is our business

We mean *real* teeth – the kind you must have for quiet, smooth operation.

Teeth that are accurate in lead, profile and finish. Teeth that make your gears do the job they are designed to do.

We know gears! And we have the latest equipment to make, inspect and *guarantee* custom gears – of all types.

Shaving capacity to 39".
Tooth Grinding to 25".
Involute charts furnished.

Let us quote on your requirements for custom gears and custom gear boxes.

CINTI® GEARS, good gears only

THE CINCINNATI GEAR CO.

Wooster Pike and Mariemont Ave. Cincinnati 27, Ohio

Custom Gear Makers Since 1907

like finishes, gives the bearings low torque and friction values. (The Fafnir Bearing Co.)

For more data circle No. 51 on postcard, p. 152

Portable Saw

This completely portable metal cutting band saw is for use primarily where power is not readily available. Combining self - power and mobility, it can be used in all types of field work. Gasoline powered, it'll cut off pipe, cable, channel,

conduit, angles, etc. The chassis, with its "wheel-barrow" principle, is rolled about on 12-in. solid rubber tired wheels. Collapsible handles are telescoped into the handle tubes, eliminating objectionable interference when the machine is in operation. (Kalamazoo Tank & Silo Co.)

For more data circle No. 52 on postcard, p. 152

Go, No-go Gage

An electronic "go, no-go" gage for speed and rate control monitors any control or limiting situation that can be stated in terms of frequency. In operation, an unknown frequency generated by one of the many types of transducers on the market is applied at the input on the instrument. Upper and lower frequency limits are selected by setting the control knobs on the front panel. Any two frequencies falling between 1 and 40,000 cps can be selected in 1 cycle increments. If the unknown frequency

falls below the lower present limit, a clearly visible red lamp marked "low" is lighted. For input frequencies equal to or above the higher preset, another red lamp marked "high" is illuminated. If the unknown frequency is equal to or greater than the lower limit and less than the upper limit, a green lamp marked "in limits" lights. (Computer-Measurements Corp.)

For more data circle No. 53 on postcard, p. 152

Aluminum Sheet

A new aluminum sheet alloy is designed to produce a super-bright anodized finish. When polished, brightened and anodized, the moderately priced sheet, designated alloy X5457, offers a lustrous mirror-like appearance. Products fashioned from the new sheet alloy, X5457, exhibit mechanical properties similar to alloy 5357 and can be rolled to the same manufacturing specifications. (Aluminum Co. of America.)

For more data circle No. 54 on postcard, p. 152

Stud Gun

A new powder-actuated stud gun handles all types of fastening requirements. It drives all sizes of pins including 5/16-in. ones. It

combines functions of light, medium and heavy duty models into one compact unit. By using three quickly interchangeable barrels the stud gun eliminates separate tools for various size pins. The operator is always able to select the most economical cartridge-pin combination for each job and is not limited by his equipment to one or two sizes

THE ELECTRIC FURNACE CO. Salem Ohio. Gas Fired, Oil Fired and Electric Furnaces

EF

FURNACES *for Processing* Wire, Tubing, Strip and Other Products *Continuously*

One of the numerous types of continuous furnaces we have built for processing various grades of silicon strip.

We are in position to design, build and put in operation: continuous equipment for hot or cold rolled, high or low carbon, stainless, silicon, tinplate, aluminum, brass, bronze or any other ferrous or non-ferrous metal—for bright annealing, normalizing, galvanizing, aluminizing, tinning or any other process—in the size and type best suited to your plant, process, product or production requirements. No job is too large or too unusual.

Put your production furnace problems up to experienced engineers—it pays.

Installation of five EF special atmosphere continuous furnaces bright annealing stainless steel wire.

3000 lbs. of steel tubing, per hour, are bright normalized in this EF gas-fired radiant tube type special atmosphere furnace.

EF

BULLETIN No. 461
shows typical installations of EF Gas-fired, Oil-fired and Electric Furnaces.
Send for a copy today!

THE ELECTRIC FURNACE CO.
GAS-FIRED OIL-FIRED AND ELECTRIC FURNACES FOR ANY PROCESS, PRODUCT OR PRODUCTION *Salem - Ohio*
Canadian Associates • CANEFCO, LIMITED • Toronto 1, Canada

of pins. The tool's design minimizes noise; its small compact size and light weight make for ease of handling. Loading and inspection are quick and easy. A special safety guard prevents firing unless the tool is in position and pressed firmly against the work surface. (Ammo Products, Inc.)

For more data circle No. 55 on postcard, p. 152

Plating Brighteners

Two new brighteners are available for cyanide zinc plating solutions. One, a powdered addition agent, provides brightness over the entire normal plating range found in still and automatic tanks. The other, a low cost liquid addition agent is for barrel plating. Its maker reports that the first gives an excellent, uniformly bright plate over current densities ranging from the lowest encountered in still plating to as high as 70 amps. It is said to provide fine grained deposits which will bright dip in nitric acid or Iridite type chromate bright dips. The liquid has a wide current density range that provides brightness for barrel plating operations both in recesses and on outside areas. This brightness is of a degree which is usually acceptable even without bright dipping, says the company. (Allied Research Products, Inc.)

For more data circle No. 56 on postcard, p. 152

miller
SRH
NEW STAR in the MILLER
GOLD STAR LINE
The revolutionary dc welding performance achieved by the new Miller Gold Star transformer, completely sealed, semimetallic rectifier and weld stabilized circuit is now available in the SRH models. Developed specifically to save room, the SRH is only 30¼" high, offers 200, 300 and 400 ampere machines ideally designed for stacking or paralleling in minimum space.
Complete particulars on the new Miller GOLD STAR SRH will be sent promptly on request.
miller ELECTRIC MANUFACTURING COMPANY, INC.
Distributed in Canada by Canadian Liquid Air Co. Ltd., Montreal • APPLETON, WISCONSIN

Precision Balls

A manufacturer of precision balls is now producing a wide range of them to operate at elevated temperatures. Alloys that have proven most suitable for high temperature uses include T-1, T-2, T-5, M-2, M-10, M-50, Cobenium, Modified 440, Stellite, Inconel. Also included are Pyrex glass balls. (Hartford Steel Ball Co.)

For more data circle No. 57 on postcard, p. 152

Press Brake

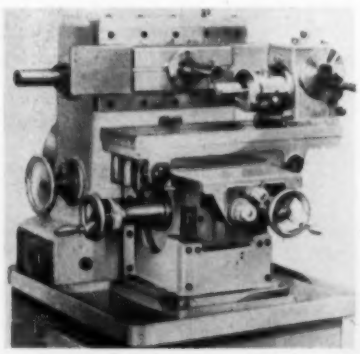
For bending and forming sheet metal, a new 25-ton capacity press brake bends 60 in. of 14-gage or 72 in. of 16-gage mild steel. An all-steel welded frame, and deep-section bed and ram of rolled steel plate assure permanent alignment and comparatively little deflection under load. A variable speed drive, through a disc-type friction clutch that can be jogged or slipped, gives a choice of speeds from 20 to 50 strokes a minute. A disc-type brake stops the ram as soon as clutch is released. (Dreis & Krump Mfg. Co.)

For more data circle No. 58 on postcard, p. 152

Form, Punch Shaper

This universal form and punch shaping machine produces contours of all kinds. It makes surfaces and punches with curved necks. Parts are turned to a tolerance of ± .00025-in., with accurate and clean cuts to all worked areas. Incorporated into the shaper are: (1) speeds of 50, 70, and 110 strokes per

minute; (2) a working area up to 6 x 6¼-in.; (3) 0 to 6-in. punch shaping, maximum length to beginning of radius 4¾-in.; (4) electric direct-drive motor 220/440 v, 60 cycles, 3 phase; (5) built-in lubrication, including instant stopping;



(6) a base with enclosed tool cabinet. With the ability to turn out irregular shaped stamping and electrode punches of high precision, this shaper employs a large dividing head with automatic circular feed, permitting the machining of radii and angles automatically. (Jersey Mfg. Co.)

For more data circle No. 59 on postcard, p. 152

Welder, Positioner

A new twin-head automatic welder and positioner is capable of mounting eight tractor rollers and one idler at a time. The welding unit builds up both sides of the worn tractor rollers simultaneously and automatically. By the time the first hard-faced roller reaches the eighth index position, it sufficiently cools to receive the second welding pass. This speeds up production. The unit can hard-face or weld up to a 38-in. diam idler without removing any of the spindles. Up to 46-in. diam round weldments may be handled by removing all eight spindles. (Sight Feed Generator Co.)

For more data circle No. 60 on postcard, p. 152

Wire Machine

A fully continuous eight block wire drawing machine employs alternating current. Designed for drawing high carbon steel wire from an inlet diameter of 0.395-in. down to the range between 0.250 and 0.125-in., the unit utilizes the straight through pull principle. Wire is led in a straight line directly from block to block through die-boxes. Large guide pulleys, mounted in front of the die-boxes, keep the wire under complete control. There is no wire accumulation on the blocks, no twisting of wire between blocks, and no slip of wire on the blocks. (Kurt Orban Co., Inc.)

For more data circle No. 61 on postcard, p. 152

Cut-down Saw

Speed, precision, and versatility in miter and compound-angle cutting are claimed for a new cut-down machine. Using a 12-in. saw or abrasive wheel, the machine produces smooth cuts and perfect angles essential to the accurate joining of metal parts. Built for 90° cut-off and miter cutting, the unit is also available with an accessory

ERIE Bolts • Studs • Cap Screws • Nuts
In Alloys • Stainless • Carbon • Bronze

Sharp eyes, made sharper by scientific instruments, verify microscopic details of thread accuracy at Erie Bolt & Nut Company. This is but one proof of the painstaking craftsmanship your own fastener specifications receive from the hands of Erie specialists. Fasteners to resist corrosion, extremes in temperature and tensile stresses to your specifications have been our exclusive job for almost half a century.
Send us your specifications for prompt estimate.

Subsidiary of
RIC
REPUBLIC INDUSTRIAL CORPORATION

ERIE BOLT & NUT CO.
Erie, Pennsylvania
Representatives in Principal Cities

purposeful planning

Here's the way to plan a more productive stamping operation. When you roll the bolster through the die area of this model press, it's easy to visualize how "push button" die setting can shrink hours of die setting time to minutes.

It costs money—lots of money—when an expensive, highly productive machine sits idle waiting for a new die setup. Let us show you, with one of our scale models, the way Clearing engineers have knocked the expense out of die setting.

More information about "Push Button" die setting and other Clearing methods of press automation is contained in a new brochure—"The New Economics of Press Automation" You'll enjoy it. Write for it today.

CLEARING PRESSES

the way to efficient mass production

CLEARING MACHINE CORPORATION *division of* **U.S. INDUSTRIES, INC.**

6499 W. 65th Street—Chicago 38, Illinois / Hamilton Division, Hamilton, Ohio

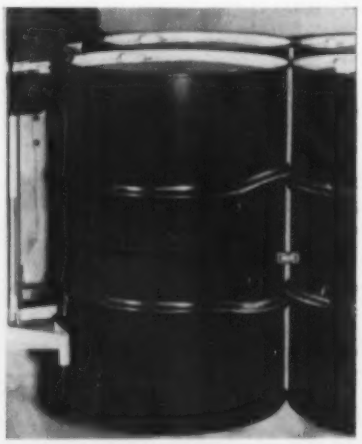
compound-angle setup. This permits cutting accurate compound angles. Another accessory is a hand crank and worm-gear assembly. This allows precise setting of the machine to accurate compound angles. An accessory for clamping

the work to the fence insures precisely accurate cuts all the way through the material. It's designed for manual or foot-pedal operation. The machine can be equipped with either a fixed or movable guard, depending on the material to be cut. (Irvington Machine Works.)

For more data circle No. 62 on postcard, p. 152

Steel Drum

Designed to save space and reduce handling and shipping costs, a new 55-gal steel drum interlocks



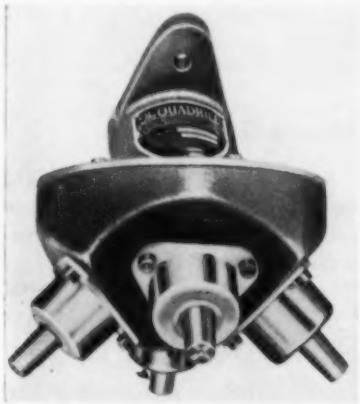
with adjacent containers when any number are unitized or packed closely together. A special rolling-hoop design is the key to the inter-

locking feature of the new container. When unitized, a group of the new drums can be handled by a standard lift truck, eliminating need for pallets. Transit damage can be sharply reduced because the drums contact each other at their six strongest points. (Vulcan Containers.)

For more data circle No. 63 on postcard, p. 152

Drill Press Heads

Four-position drilling and tapping heads now available have an expanded quill sleeve. This lets them fit larger size quills on 15- and 20-in. Delta drill presses. The



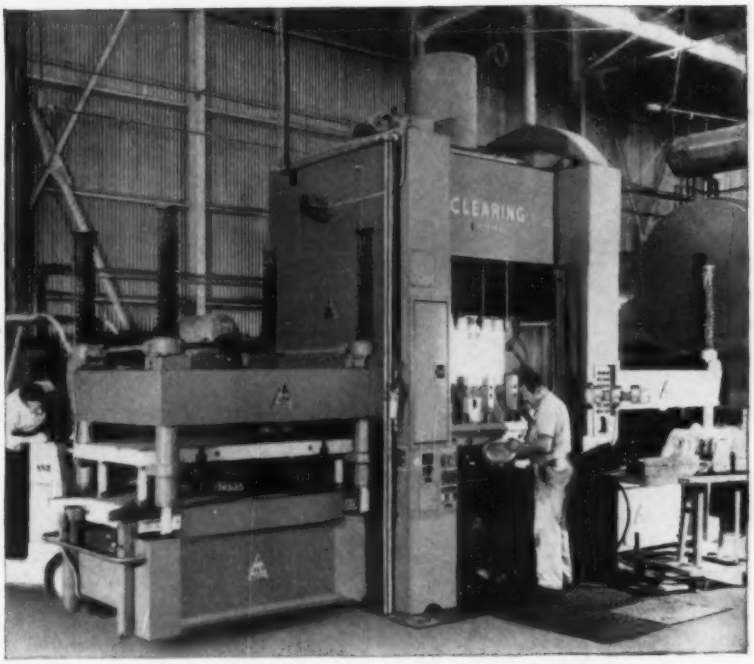
quadrills drill, ream, countersink and counterbore. They perform all these operations without setting up each time. (Chicago Quadrill Co.)

For more data circle No. 64 on postcard, p. 152

O-Ring Kit

A new kit provides maintenance men with "O" rings in sizes usually required for emergency or for planned replacement schedules. The kit contains 180 "O" rings in sizes from 1 to 25. These sizes, surveys indicate, are used on 70 pct of industrial equipment incorporating "O" rings as sealing members. The patented, shock-resistant, plastic case in which the rings are packed serves also as a gaging or measuring tool. The rings are packed on pegs that duplicate the shafts on which the rings are to be used. Interchange information of all leading producers of "O" rings is supplied with each kit. (Bearings, Inc.)

For more data circle No. 65 on postcard, p. 152



predictable results

Here it is. A Clearing moving bolster press now earning its keep and then some at North American Aviation, Inc.

Moving bolster presses are especially useful at North American where press runs are comparatively short. "Push Button" die setting turns downtime into productive machine hours. And it's literally "push button", too! When one job is finished, push a button. The new set of dies roll into place ready for the next job.

Estimate the downtime die changing causes in your shop and you can make a pretty good guess as to whether "push button" die setting will pay off for you.

More information about "Push Button" die setting and other Clearing methods of press automation is contained in a new brochure—"The New Economics of Press Automation" You'll enjoy it. Write for it today.

CLEARING PRESSES

the way to efficient mass production

CLEARING MACHINE CORPORATION *division of* **U.S. INDUSTRIES, INC.**

6499 W. 65th Street—Chicago 38, Illinois / Hamilton Division, Hamilton, Ohio

Large
or small
INDUSTRIAL
CUT
GEARS

- FURNISHED COMPLETE
- CUSTOM CUT FROM YOUR BLANKS
- HEAT-TREATED, CASE OR FLAME-HARDENED

SIMONDS GEAR produces a complete line of industrial cut gears in a full range of sizes from cast or forged steel, gray iron, bronze, Meehanite, rawhide or bakelite. Also heat-treated, case or flame-hardened carbon or alloy steel. Or, you may have your own gear blanks custom cut to your order. Same quality . . . same prompt service. Send us your requirements for quotation.

ALSO stock carrying distributors of Ramsey Silent Chain Drives and Couplings; and industrial V-belts.

SPUR GEARS • BEVEL GEARS • MITRE GEARS
WORMS • WORM GEARS
RACKS
PINIONS

SIMONDS GEARS
THE SIMONDS GEAR & MFG. CO.
LIBERTY at 25TH PITTSBURGH 22, PA.

Quality Gears for over 65 years

FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 152.

Standard Fasteners

Standard fasteners of many types and sizes are listed in a 40-page catalog. In addition to describing the manufacturer's stamping, cold heading and screw machine facilities, it also contains helpful purchasing data. (Abbott Screw & Bolt Co.)

For free copy circle No. 1 on postcard, p. 152

Clad Plastic

Now you can join vinyl with metal to give products both stability and attractive appearance. It's done with a new plastic cladding material. This vinyl sheeting conforms to practically any shape. It's easy to cut, crimp, or bend. (The Masland Duraleather Co.)

For free copy circle No. 2 on postcard, p. 152

Rubberized Abrasives

Rubberized abrasives for deburring, smoothing and polishing operations are covered in a catalog. It introduces the abrasives, tells how they're used, what they can do. (Cratex Mfg. Co.)

For free copy circle No. 3 on postcard, p. 152

Cold Rolled Strip

Cold rolled strip is featured in a 4-page publication. Comparison charts give data on flat wire and strip. These cover: Monel, K Monel, nickel, Permanickel, Duranickel, Inconel, Inconel X, Ni-span-C, type 302 stainless, 17-7 PH stainless, beryllium copper, phosphor bronze, and high carbon spring steel. (Techalloy Co., Inc.)

For free copy circle No. 4 on postcard, p. 152

Micro Switch

Pull-to-unlock sealed toggle switches are described in a data sheet. (Micro Switch Div., Minneapolis-Honeywell Regulator Co.)

For free copy circle No. 5 on postcard, p. 152

Drill Grinder

Drill grinders for grinding 1¾ to 5-in. diam drills are described in a bulletin. (Consolidated Machine Tool Div., Farrell-Birmingham Co., Inc.)

For free copy circle No. 6 on postcard, p. 152

Chemical Milling

Chemical milling is analyzed in a 10-page brochure. It describes chemical milling, gives its advantages, tells what metals can be milled. (U. S. Chemical Milling Corp.)

For free copy circle No. 7 on postcard, p. 152

Grinding

A handy grinding room calculator tells at a glance just how much grinding concentrate to add to a tank for a desired mixing proportion. Figured in pints, quarts and gallons, it covers tanks with capacities ranging from 10 to 150 gal.

The calculator also translates grinding wheel diameters and rpm

into surface speeds in feet/minute. (For free calculator, write on company letterhead to White & Bagley Co., 100 Foster St., Worcester, Mass.)

Fire Safety

A 12-page catalog describes portable fire extinguishers, built-in carbon dioxide fire extinguishing systems, smoke detecting systems, and rate-of-rise fire detecting systems. (Walter Kidde & Co., Inc.)

For free copy circle No. 8 on postcard, p. 152

Wire Strapping

Speed, simplicity and savings are key features of a wire strapping unit described in a dozen-page pamphlet. It also covers round and oval wire and manual or power-operated wire tying machines. (A. J. Gerrard & Co.)

For free copy circle No. 9 on postcard, p. 152

Cooling System

How a modern company turned an ancient technique into a new cooling system is explained in the latest issue of a steel firm's publication. The system described absorbs heat. (Allegheny Ludlum Steel Corp.)

For free copy circle No. 10 on postcard, p. 152

Hot Rolled Steels

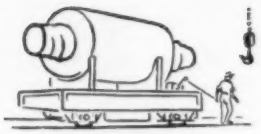
Hot rolled steels are reviewed in a buyers' guide. It contains information on hot-rolled steel bars, structurals, plates, sheets and strip. It explains how products may be combined to effect savings. (Joseph T. Ryerson & Son., Inc.)

For free copy circle No. 11 on postcard, p. 152

Hydraulic Tables

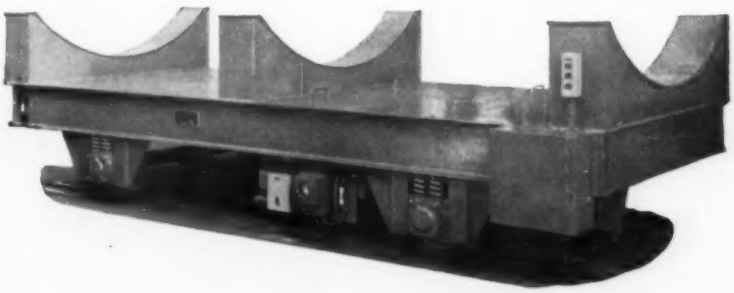
Hydraulic tables and other engineering data to aid hydraulic press engineers and designers appear in a 40-page booklet. It describes and illustrates the range of one maker's presses for such applications as producing laminated plastics, die hobbing, metal powder compacting, etc.

Links up your HANDLING NETWORK



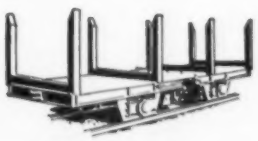
for added efficiency . . .

extra economy

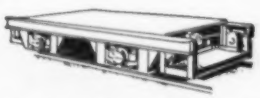


ATLAS WALK-ALONG

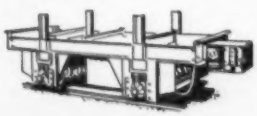
SAFETY-TYPE TRANSFERS



Special bed designs to cradle your load.



Single platform or double platform-operator rides.



Versatile power . . . diesel or gas electric, storage battery, or cable reel. Also remote control with no trailing cable.

If you're responsible for maintaining safe, low cost movement of heavy loads, (5 to 200 tons) and intermediate transfer of these loads during process or storage, Atlas can help you by engineering a transfer car to meet your exact load and power requirements.

Atlas engineering gives you every modern safety feature for personnel protection.

. . . choice of power and control including:

1. Single lever (walk-along) forward, reverse with safety stop when lever is released.
2. Storage battery power with built-in charger.

For Cost-Saving Details Request "Walk Along" Bulletin 1283

THE ATLAS CAR & MFG. CO.

1140 IVANHOE ROAD • CLEVELAND 10, OHIO

ENGINEERS & MANUFACTURERS SINCE 1896

new shock-absorber

chipping hammers by Ingersoll-Rand

Ingersoll-Rand has done it again—introduced a "shock-absorber" chipping hammer. Here are a few of the advantages this new concept in hammer design gives you:

- **Provides new operator comfort and efficiency**
- **Cushions the chisel in the cut**
- **Absorbs chisel vibration**
- **Substantially reduces noise**
- **Eliminates maintenance due to improper operation**

These new Shock-Absorber Chipping Hammers are made in 5 sizes—each with four easily converted power ranges. This means you have 20 power combinations to meet exactly the cutting need of any type of job.

Call your nearby Ingersoll-Rand AIRengineer. He will be glad to show you this revolutionary new tool, and let you test it in your own shop, on your own work. Both you and your men will prefer it. Ingersoll-Rand, 11 Broadway, New York 4, N.Y.

8-750

Ingersoll-Rand

Tools plus AIRengineering increase output per man

FREE LITERATURE

(For free copy, write on company letterhead to Hydraulic & Compacting Press, Hamilton Div., Baldwin-Lima-Hamilton Div., Hamilton, O.)

Materials Handling

How two different companies solved their materials handling problems is explained in two new case history bulletins. Each 4-page publication tells how modern equipment get the jobs done. (Lewis Shepard Products, Inc.)

For free copy circle No. 12 on postcard, p. 152

Steel Movies

Motion pictures available from a major steel producer are listed in a brochure. These films cover about all phases of the company's operations. They are 16mm color and black-and-white. (Bethlehem Steel Co.)

For free copy circle No. 13 on postcard, p. 152

X-Ray Viewer

An expanded contrast X-Ray viewer is described in a 4-page folder. It tells how this unit boosts testing and inspection department efficiency in using X-Ray and photographic transparencies. (Philco Corp.)

For free copy circle No. 14 on postcard, p. 152

Protective Coats

Catalytic protective coatings for a wide range of industrial uses are described in an 8-page bulletin. Featuring high adhesion, durability and wear resistance, these coatings adapt to use on many items. (Industrial Finishes Co., Inc.)

For free copy circle No. 16 on postcard, p. 152

No-corrode Linings

Corrosion-proof tank linings are described in a 4-page bulletin. These linings are primarily for protecting concrete and steel vessels from attack by corrosive elements. (Atlas Mineral Products Co.)

For free copy circle No. 17 on postcard, p. 152

A SERVICE THAT MEANS SAVINGS

UNUSUAL SIZES

1/8" to 3" THICK
1/2" to 12" WIDE

IMMEDIATE SHIPMENT ANYWHERE

AVAILABLE IN SMALL QUANTITIES

FROM WAREHOUSE STOCKS

Now . . . you can get the exact sizes you want in COLD ROLLED FLATS . . . without delay . . . without waste from VIKING STEEL. From our current stocks listed below we can make shipment same day as order received to any location in the country . . . in quantities from a single piece to a carload. Other types of bars, sheets and plates are stocked in an equally large range of sizes. To save time and money on your steel needs — get to know VIKING. Send coupon today for latest stock list.

COLD DRAWN FLATS

Size	Lbs.
1/8" x 1/2"	4.900
1/8" x 3/4"	5.700
1/8" x 1"	1.800
1/8" x 1¼"	5.400
1/8" x 1½"	2.400
1/8" x 1¾"	3.900
1/8" x 2"	3.200
1/8" x 2½"	4.700
1/8" x 3"	6.000
1/8" x 3½"	4.500
1/8" x 4"	5.100
1/8" x 5"	5.200
1/8" x 6"	
3/16" x 1"	4.000
3/16" x 1¼"	5.500
3/16" x 1½"	3.700
3/16" x 2"	4.700
3/16" x 2½"	5.500
3/16" x 3"	5.500
3/16" x 4"	6.000
3/16" x 5"	6.000
3/16" x 6"	6.000
1/4" x 1/2"	5.000
1/4" x 3/4"	2.200
1/4" x 7/8"	5.500
1/4" x 1"	3.200
1/4" x 1¼"	4.500
1/4" x 1½"	3.300
1/4" x 1¾"	4.000
1/4" x 2"	3.300
1/4" x 2½"	2.000
1/4" x 3"	2.000
1/4" x 4"	5.000
1/4" x 5"	3.400
1/4" x 6"	3.000
1/4" x 8"	5.700
1/4" x 10"	4.000
5/16" x 3/4"	4.700
5/16" x 7/8"	6.800
5/16" x 1"	4.600
5/16" x 1¼"	5.800
5/16" x 1½"	2.800
5/16" x 2"	4.300
5/16" x 2½"	5.700
5/16" x 3"	5.500
5/16" x 4"	6.700
5/16" x 5"	3.700
5/16" x 6"	2.400

Size	Lbs.
3/8" x 3/4"	1.800
3/8" x 1"	6.900
3/8" x 1¼"	4.100
3/8" x 1½"	5.000
3/8" x 1¾"	1.800
3/8" x 2"	3.200
3/8" x 2½"	1.500
3/8" x 3"	2.600
3/8" x 3½"	6.800
3/8" x 3¾"	2.400
3/8" x 4"	1.600
3/8" x 4½"	5.800
3/8" x 5"	5.000
3/8" x 6"	2.300
3/8" x 8"	4.400
3/8" x 10"	3.400
3/8" x 12"	1.200
1/2" x 3/4"	7.300
1/2" x 7/8"	4.200
1/2" x 1"	3.500
1/2" x 1¼"	3.200
1/2" x 1½"	2.800
1/2" x 1¾"	1.900
1/2" x 2"	2.000
1/2" x 2¼"	4.400
1/2" x 2½"	4.400
1/2" x 3"	3.700
1/2" x 3¼"	4.700
1/2" x 3½"	1.900
1/2" x 4"	4.500
1/2" x 5"	6.000
1/2" x 6"	4.500
1/2" x 8"	2.800
1/2" x 10"	4.400
1/2" x 12"	3.600
5/8" x 3/4"	4.300
5/8" x 7/8"	2.200
5/8" x 1"	6.300
5/8" x 1¼"	1.900
5/8" x 1½"	2.400
5/8" x 1¾"	3.000
5/8" x 2"	4.100
5/8" x 2½"	2.800
5/8" x 3"	3.700
5/8" x 4"	2.800
5/8" x 5"	3.100
5/8" x 6"	3.400
5/8" x 8"	2.600
5/8" x 10"	4.400
5/8" x 12"	1.800
	2.100

Size	Lbs.
3/4" x 7/8"	6.000
3/4" x 1"	1.800
3/4" x 1¼"	5.300
3/4" x 1½"	4.300
3/4" x 1¾"	4.600
3/4" x 2"	4.400
3/4" x 2½"	2.700
3/4" x 3"	6.000
3/4" x 3½"	8.800
3/4" x 4"	4.200
3/4" x 4½"	5.800
3/4" x 5"	6.000
3/4" x 6"	3.600
3/4" x 8"	1.600
3/4" x 10"	2.400
3/4" x 12"	1.700
7/8" x 1¼"	2.200
7/8" x 1½"	5.600
7/8" x 1¾"	8.300
7/8" x 2"	10.600
7/8" x 2¼"	7.800
7/8" x 2½"	4.800
7/8" x 3"	6.600
7/8" x 4"	8.500
7/8" x 6"	2.800
1" x 1¼"	5.200
1" x 1½"	2.700
1" x 1¾"	2.000
1" x 2"	3.800
1" x 2¼"	6.700
1" x 2½"	3.300
1" x 3"	4.700
1" x 3¼"	10.700
1" x 3½"	5.500
1" x 4"	4.500
1" x 5"	3.200
1" x 6"	6.000
1" x 8"	2.900
1" x 10"	2.800
1" x 12"	2.500
1¼" x 1½"	1.500
1¼" x 1¾"	9.600
1¼" x 2"	3.200
1¼" x 2½"	4.400
1¼" x 3"	4.300
1¼" x 3½"	3.100
1¼" x 4"	3.500
1¼" x 6"	5.500
1¼" x 8"	6.300
1¼" x 10"	6.100
1¼" x 12"	

Size	Lbs.
1½" x 1¾"	3.500
1½" x 2"	3.800
1½" x 2½"	4.100
1½" x 3"	3.300
1½" x 3½"	6.000
1½" x 4"	2.200
1½" x 5"	3.900
1½" x 6"	3.600
1½" x 8"	3.500
1½" x 10"	3.200
1½" x 12"	5.900
1¾" x 2"	1.500
1¾" x 2½"	6.500
1¾" x 3"	2.100
1¾" x 3½"	1.500
1¾" x 4"	2.400
1¾" x 5"	3.800
1¾" x 6"	3.000
1¾" x 8"	2.100
	2.700
	4.000
2" x 2½"	5.800
2" x 2½"	5.100
2" x 3"	4.300
2" x 3½"	4.400
2" x 4"	6.200
2" x 5"	4.400
2" x 2¼"	5.800
2" x 2½"	5.100
2" x 3"	4.300
2" x 3½"	4.900
2" x 4"	6.200
2" x 5"	4.400
2" x 6"	2.800
2" x 8"	5.500
2" x 10"	4.000
2" x 12"	2.000
2¼" x 6"	2.100
2¼" x 10"	1.900
2½" x 3"	4.000
2½" x 3½"	6.000
2½" x 4"	4.100
2½" x 5"	6.100
2½" x 6"	2.900
3" x 4"	5.200
3" x 5"	6.200
3" x 6"	1.700

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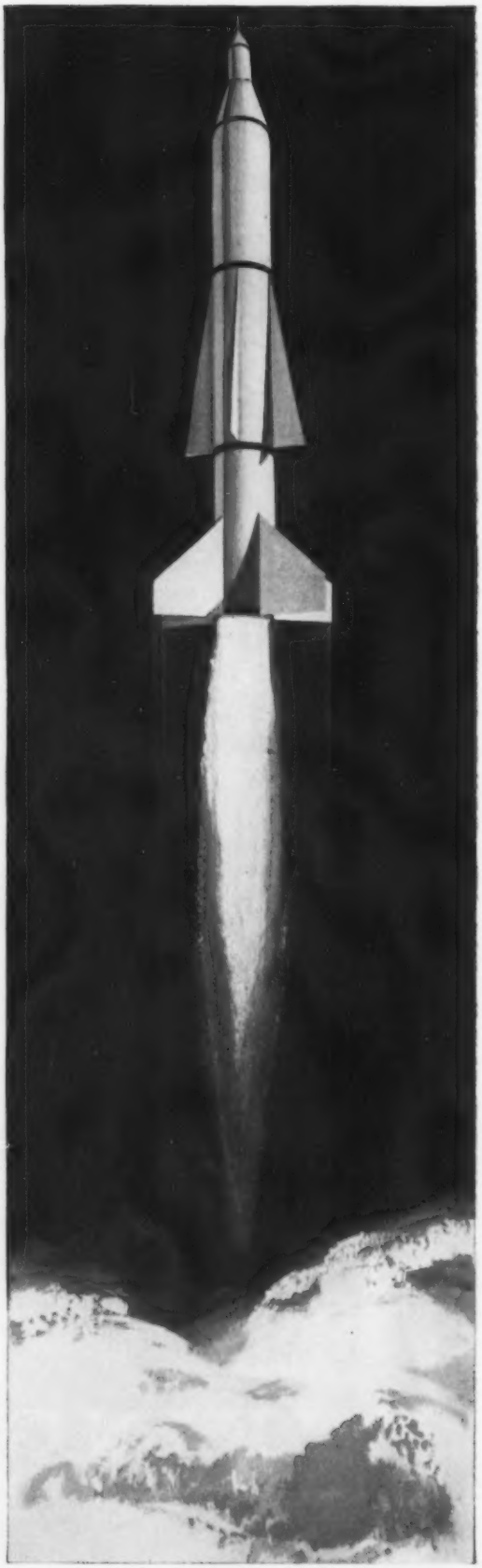

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Stretchers for steel strapping are described in an 8-page booklet. Three pages of pictures show these stretchers can be used on almost any strapping application. (Acme Steel Co.)

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Cap Screws

To introduce its new cold-forged socket-head cap screws a fastener producer is giving away a sampler puzzle. (Set Screw and Mfg. Co.)

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Induction Heaters

Features of high-frequency induction heaters and induction melting furnaces are outlined in a 12-page bulletin. (Allis-Chalmers Mfg. Co.)

For free copy circle No. 23 on postcard

Lighted Pushbuttons

An 8-page data sheet describes an all-new modular-mount series of small lighted pushbutton switches. Two built-in indicator lights per unit offer considerable flexibility. Two, three, and four-pole units are available, in alternate-action, light-force and positive touch-feedback designs. (Micro Switch Div., Minneapolis-Honeywell Regulator Co.)

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Control Equipment

Supervisory control equipment is featured in a 16-page bulletin. It describes functions ranging from opening and closing of switches and valves, to adjustments of speed, voltage or load. Equipment can be used to control and supervise any piece of electrical apparatus which has provisions for local control. (General Electric Co.)

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Stainless Mill

"A Trip Through The Mill," is the title of a booklet which offers glimpses of a large stainless steel production plant. It briefly reviews the making of stainless sheet and plate. (Eastern Stainless Steel Corp.)

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Blast Cleaners

Airless blast cleaning machines are dealt with in a 32-page catalog. So are wet blast, air blast and dust control units. Also included: cast steel shot and grit abrasives, sand-cutters, core rod straighteners. (For free copy write on company letterhead to Wheelabrator Corp., 1145 S. Byrkit St., Mishawaka, Ind.)

Protective Coatings

Just off the press is a new industry-wide 36-page protective coatings manual. It features actual color chips of 102 different coating items. Also covered are: surface preparation, use of primers and finish coatings, and availability of special custom coatings where required. (Rust-Oleum Corp.)

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Drying Units

Convection dryers are described in a 4-page bulletin. These dryers are of the solid desiccant type for removing moisture from air and other gases. (C. M. Kemp Mfg. Co.)

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Weighing Scale

Literature now obtainable announces a new line of scales capable of proving weight accuracies in

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FREE LITERATURE

the range of one part in 5000 up to one part in 20,000. These automatic product and package check-weighing machines come in capacities from one gram up to 100 lb. (Exact Weight Scale Co.)

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Die Set Accessories

Die set accessories are listed in an 8-page catalog. It describes a line of die supplies, including: hard steel drills, transfer screws, layout fluid, die rubber, oilers, hex head cap screws, lock washers, hexagon nuts, spherical washers, cast iron hand knobs, pry bars, and various types of screws and bolts. (E. W. Bliss Co.)

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Coke-quenching Valves

Coke-quenching valves are described in a bulletin. Installation arrangements, parts lists, and dimensions are included for both coke-quenching valves and drain valves. (Golden-Anderson Valve Specialty Co.)

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Brass Products

A 16-page booklet supplies data on chemical, physical and mechanical properties of brass alloy products. Brass rod, wire, welding rods, hot pressed forgings, and pressure die castings are covered. (Titan Metal Mfg. Co.)

For free copy circle No. 32 on postcard

Casting Resin

Unlimited-thickness casting plastic material is described in a data sheet. (Furane Plastics, Inc.)

For free copy circle No. 33 on postcard

Mounted Wheels

Abrasive mounted wheels are featured in a catalog. It gives general information regarding grinding action, wheel markings, grade, bond types, abrasive types, structures, grain size, spindles and treatments. (Bay State Abrasive Products Co.)

For free copy circle No. 34 on postcard

Fasteners

A comprehensive fastener handbook contains information on rivets and riveting machines. In its 42 pages it also includes an evaluation questionnaire. This permits users to determine which type fastener to use. (For free copy write on company letterhead to Judson L. Thomson Mfg. Co., Waltham 54, Mass.)

Turret Lathes

Automatic ram type turret lathes featured in a 10-page catalog have hydraulic drive. This drive turns the hand-type lathes into automated ones. (Gisholt Machine Co.)

For free copy circle No. 35 on postcard

Ballizing

For use in sizing and finishing holes by the ballizing process, a universal work-holding fixture is announced in a 16-page bulletin. The process consists of passing a ball of suitable size and hardness through the unfinished hole. It gives a precision, fine finish, (Industrial Tectonics, Inc.)

For free copy circle No. 36 on postcard

Height Gage

A data sheet describes a vernier height gage. It makes possible easy readings of 0.001 in. Available in 18 to 84-in. sizes, it takes just five seconds to adjust. (Tubular Micrometer Co.)

For free copy circle No. 37 on postcard

Wet Blast Cleaning

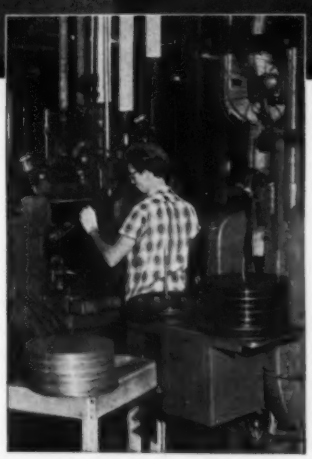
A 4-page folder describes a "wet" blast cleaning cabinet. With this unit, compressed air forces a slurry of water and fine abrasive against work to be finished. (Pangborn Corp.)

For free copy circle No. 38 on postcard

TO KEEP REJECTS TO A MINIMUM AT RCA VICTOR RECORD DIVISION

Pumps must maintain pressures accurately ...24 hours a day...5½ days a week

Here's the problem. Millions of records per month pour from a battery of hydraulic molding presses in RCA Victor's Rockaway, N. J., Record Division plant. The entire operation is highly dependent upon the pumps in the central hydraulic system. If there is pressure variation, record mold cavities don't fill. Reject rates go up fast. If pumps fail . . . presses shut down. Either way, critical delivery schedules become so much scrap paper . . . RCA's reputation for fast dependable service suffers.



How RCA Solved the Problem. Five Aldrich-Groff variable stroke "Powr-Savr" pumps supply hydraulic pressure for the molding presses. They provide stepless, straight-line capacity control from zero to rated output. Automatic adjustment maintains pressures accurately and indefinitely at 1800 psi. Molds fill properly, rejects are minimized. Another plus: pumps handle water as a hydraulic medium . . . completely eliminating fire hazard.

Results: Excellent, right from the start. Four Aldrich-Groff pumps were installed between 1947 and 1950. In 1954 they were moved to the new Rockaway plant, and in 1956 another was installed. Pump dependability has been perfect . . . only routine maintenance.

Yet they have operated "round-the-clock", 5½ days a week since installation. Mr. F. G. Stubbs, Plant Engineer, has this to say, "These Aldrich Pumps do a wonderful job". Want more information? Write Aldrich Pump Company, 8 Pine Street, Allentown, Pa.

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"...and we saved again this month with help on purchasing from Ryerson"

More and more, cost-conscious management is receiving reports like this—as a direct result of dollar-stretching planned purchasing from Ryerson.

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The Iron Age Summary

Small Users Bolster Steel Hopes

Influx of new business from small companies is cheering news for steel men.

But most large users are still shying away, particularly automotive.

▪ Steel men are blowing hot and cold this week. They're cheered by an influx of orders from small customers, but depressed by the lethargy of most big users.

The order pickup from the "little fellows" is not enough to save March from a steel production standpoint. But if the trend continues, the accumulation of orders could be enough to spark a significant production increase in April.

No Groundswell—Without some help from automotive, the railroads, and appliances, most steel men are resigned to a so-so market situation until mid-year. In fact, the consensus today is that a real groundswell is hardly likely to develop until third quarter.

One optimistic note: The steel production rate today is closely keyed to actual business volume. Backlogs for most mills are a thing of the past and user inventories are low. So an improvement in the business of steel customers could be reflected quickly in the steel ingot rate.

How Salesmen See It—This is how some product managers are thinking on the market outlook in their fields:

Pipe and tubing: "Don't ask me why, but I think things will start up this month."

Sheets: "Things are bumping along bottom. The big spurt probably won't come before the middle of the third quarter."

Bars: "Price buying and warm weather will probably bring a slight improvement in the second quarter, but we don't look for a big pickup before fall."

Tinplate: "March will be better than January or February. We expect shipments to hold at a high level through June. The third quarter could be good."

Detroit Confusion — In Detroit, the steel market picture changes from day-to-day, and the mills aren't quite sure where they stand. Orders are canceled one day, reinstated the next. Other tonnages may be set back, or increased or decreased.

One steel executive describes the Detroit situation as akin to running a foot race while jumping up and down: "It's a lot of work, but you don't seem to get anywhere."

Delivery Makes Difference—Quick delivery is still a potent factor in the steel salesman's tool kit. And some companies are pointing this out to their workers and production heads. Ability to make prompt delivery can spell the difference between getting or losing an order.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week 1,442	Last Week 1,425	Month Ago 1,445	Year Ago 2,407
Ingot Index (1947-1949=100)	89.8	88.7	90.0	149.7
Operating Rates				
Chicago	57.0	58.0*	58.0	91.0
Pittsburgh	54.5	55.5*	57.0	99.0
Philadelphia	56.0	57.0	64.0	103.5
Valley	43.0	44.5*	41.0	92.0
West	74.0	74.0*	67.5	102.5
Buffalo	37.0	37.0	37.0	95.0
Cleveland	35.0	34.0*	46.0	87.0
Detroit	44.0	44.0*	52.0	95.0
S. Ohio River	52.5	28.0*	52.0	80.0
South	49.5	51.5	44.0	95.5
Upper Ohio R.	71.5	67.5*	58.0	95.0
St. Louis	79.0	79.0	78.0	91.0
Northeast	31.0	31.0	31.0	66.0
Aggregate	...	52.8	53.5	94.0

*Revised

Prices At a Glance

(cents per lb unless otherwise noted)	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.967	5.967	5.967	5.670
Pig Iron (Gross ton)	$66.49	$66.49	$66.42	$64.68
Scrap, No. 1 hvy (Gross Ton)	$37.33	$37.67	$37.33	$49.50
No. 2 bundles	$28.50	$28.50	$29.17	$40.50
Nonferrous				
Aluminum ingot	28.10	28.10	28.10	27.10
Copper, electrolytic	25.00	25.00	25.00	32.00
Lead, St. Louis	12.80	12.80	12.80	15.80
Magnesium ingot	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin Straits, N. Y.	95.75	94.75	93.00	98.75
Zinc, E. St. Louis	10.00	10.00	10.00	13.50

Prices Spur to Press Buying

Purchasers, while still cautious, are showing more interest in buying.

Present competitive prices are sales stimulant sometimes too strong to resist.

▪ Press builders certainly anticipate no sales boom. Delivery is excellent and pricing highly competitive. It's current opinion that year-end dollar volume will find the industry doing 35-45 pct less business than in 1957.

So there is little hullabaloo. Making forecasters even more cautious is the fact that the inquiry rate for heavier, special purpose presses has shown little or no gain. In some cases it has continued the slide of fourth quarter 1957.

Estimates Revised Upward—Opinion on the business outlook for presses and press brakes has begun to split down the middle. But even that is an encouraging sign. Four weeks ago, most press manufacturers were revising their sales estimates for this year downward. Business was dropping between 40 and 50 pct lower.

But in the short space of one week, there have been a few glimmerings that buyers are moving back into the market. Particularly the small buyers who use many small presses rather than a few specially built pieces. Today's press buyer is cautious, but he's beginning to sense the bargains predicted earlier. And he's finding some of the material offered just too good to turn down.

New Orders Help—For instance, Detroit buyers came into the market recently. The purchases were small, but new orders were enough that one press manufacturer will go back to a 40-hour week if business holds at present levels for another week.

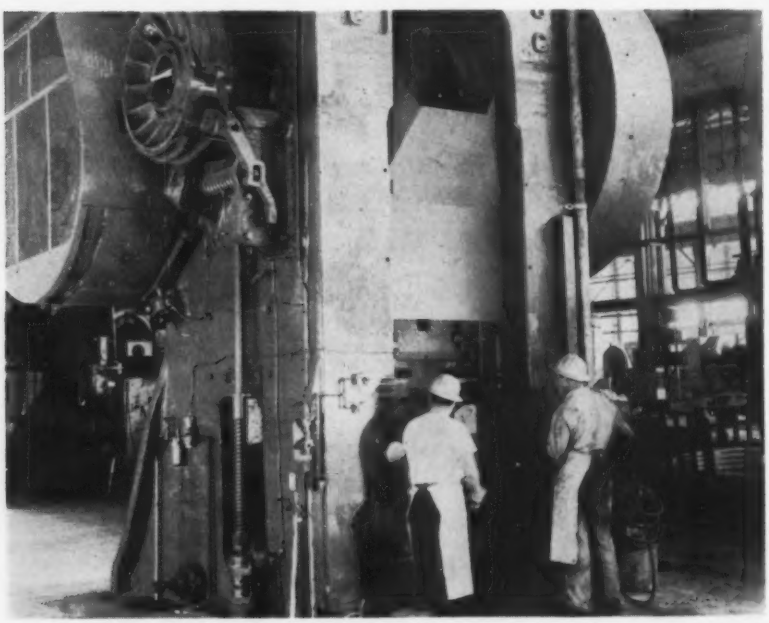
Cold extrusion equipment has been relatively good, and now job shop and appliance business is beginning to pick up.

One manufacturer, for example, was 40 pct off year-ago business levels in January. On closing the books on February, he found that the gap had closed to 25 pct. This increase is exceptionally strong, but the mere fact that it exists certainly adds a new tone to a previously slow selling season.

Fast Delivery Will Stay—Deliveries will continue to be very rapid for the remainder of the year. Few builders, even where they've noted a sales gain, have seen their backlogs show improvement. Again, at least 50 pct of the number queried are on a four-day week and will continue at that level in the weeks ahead. Many are continuing to book outside contract work and continue looking for new jobs in this line.

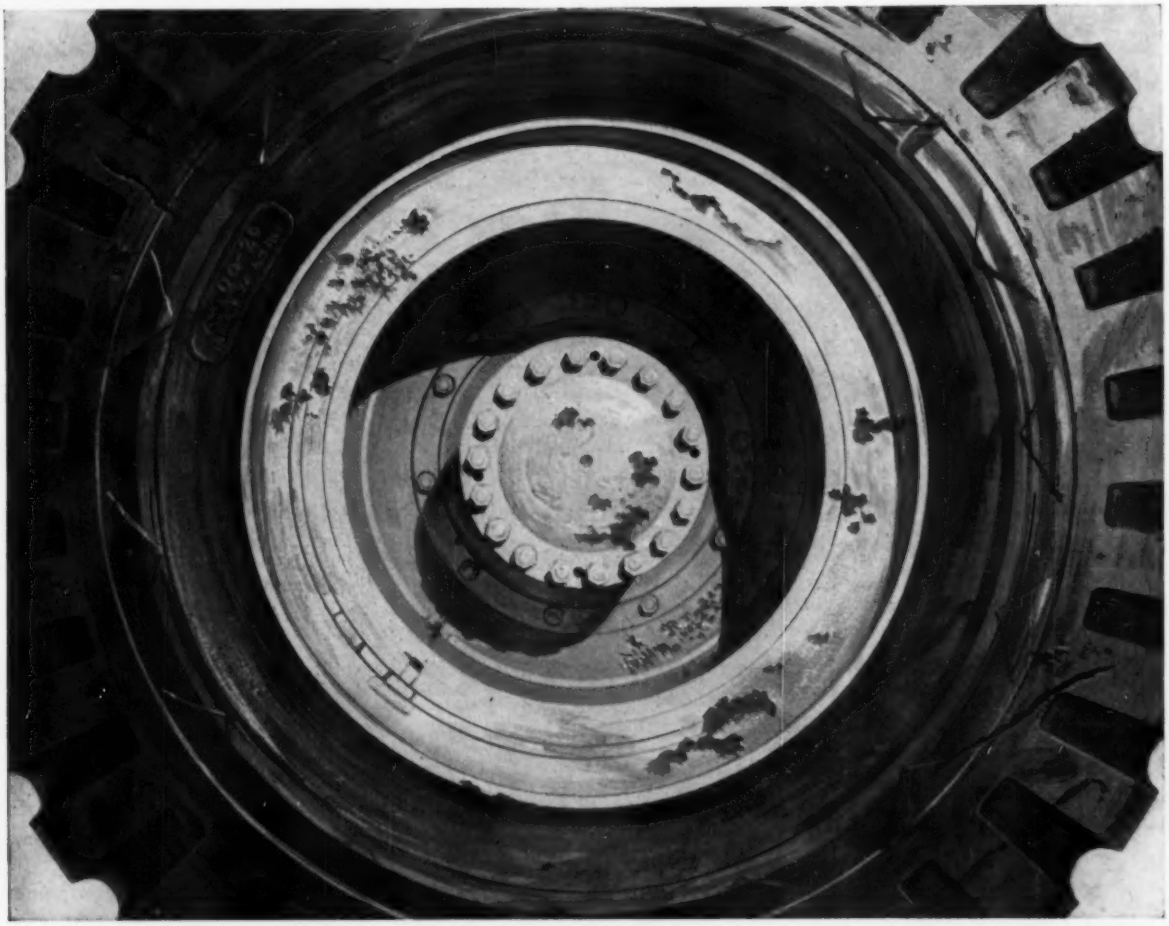
Whether the present highly competitive price levels can be maintained isn't quite as positive. With some wage increases in the outlook, manufacturers may have to revise present pricing schedules. Profit margins are already badly beaten down and haven't been much improved by the competitive situation in recent months.

There's at least some theorizing that competitive pricing accounts for a part of the orders now coming in. Small buyers, tight for working cash, are keeping a close weather eye on the market and think that between now and June may be the time to buy.



ALUMINUM'S LARGEST: Mechanical forging press, rated at 3000-tons capacity, has started production at Vernon Works of Aluminum Co. of America. Unit was built to Alcoa specifications by the Ajax Mfg. Co.

BETTER PROTECTION for metal surfaces



Isophthalic based paints last longer under severest conditions—*resistant to checking, peeling, chipping*

Now you can add years of protection to metal surfaces thanks to the adhesive properties of Isophthalic based paints. Better film to metal bond means improved performance with fewer prime coats required—saves time, cuts painting costs.

Surface coatings made with Isophthalic have better abrasion resistance than ordinary paints, hold up longer under severe weather conditions, provide improved gloss retention. Whether you buy exterior or interior paints, finishes for furniture or tough coatings for machinery it will pay you to find out about Isophthalic based paint.

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4631

Depleted Inventories Spur Ordering

Small tonnage orders result as some users buy steel to fill out stocks.

However, no widespread improvement in the market is expected before fall.

▪ Depleted stocks are bringing some smaller steel users back into the market.

Although the tonnages are not large, the mills are mildly encouraged by the orders. "It just means steel is being used up," says one sales official, "and right now that's a hopeful sign."

Warehouses in the Midwest, for example, are ordering because they've just about wiped out sheet inventories in the most popular sizes.

Strictly for Use—Although stock filling is one ordering motive, another is need for steel for immediate use. Structural fabricators in the East have stepped up buying to complete pending jobs. Mills report sizes being ordered clearly indicate the steel is going right to the jobs and not to stock.

Only pocket-size optimism is resulting from this new ordering activity. Too many of the larger steel consumers are still sitting on the fence. Automotive buyers continue canceling and setting back tonnages. Their purchasing pattern has been described as—order, cancel, re-order a larger tonnage, and then defer a part of the new order.

In over-all analysis, the market outlook is still the same: Probably no major improvement until the fall.

Structurals — Buying by fabricators, frequently in small tonnages, is pepping up the Eastern market to a degree. However, the purchasing is clearly for direct use and not for stock.

Producers there say orders are late coming in because customers know that supplies are plentiful. Mill rollings usually provide enough non-committed product to fill orders until the next rolling is scheduled. One mill there is on two turns a day to fill March orders and keeping fingers crossed about April bookings.

Light structurals are showing a little more improvement at **Midwest** mills. But wide flange beams are not included in the purchasing and heavy standards are a drug on the market.

A **West Coast** structural manager sums things up this way, "Structurals are deader than a doornail. Until some of the big bridge, highway, and industrial developments come to life there won't be much hope for new business."

Pipe and Tubing — Buttweld pipe is showing some seasonal pickup, but other products are slow.

Construction industry buying of buttweld is helping that market. Both jobbers and consumers are more active. Seamless tube orders are running behind month ago levels for **Cleveland** producers. In fact, oil companies in that area are selling off pipe inventory. News that the Memphis decision will be reviewed in a year, instead of this April as expected has done nothing to improve the linepipe market. However, some major projects such as the Texas-Florida line will continue under construction and these are the major hope of the pipe mills.

Bar—Market is not receding any further, but neither is it making any gains. March production is expected to equal February levels for some producers. A little improvement is expected in the second quarter but any real pickup will probably be delayed until fall.

Tinplate — A satisfactory first half for the mills seems likely. March orders at one **Pittsburgh** producer are expected to better those of January or February. However, the overseas market, which accounted for about 10 pct of tinplate shipments last year, appears likely to decline. Export shipments fell from 836,000 tons in 1955 to 719,000 in 1956 and to 603,000 tons in 1957.

Stainless — Market is sluggish with slight gains reported in some areas. Light flat-rolled stainless products mainly used for trim on appliances and kitchen furnishings are holding up fairly well. Jones & Laughlin's Stainless Steel Div. at Detroit has been shutdown for a week.

Sheet and Strip—No significant market improvement is expected before fall. March tonnages won't top or fall much below February's for the majority of mills. Automotive deferments and cancellations cloud the outlook. However, some small tonnage customers are doing more buying, presumably to restock depleted inventories.

PURCHASING AGENT'S CHECKLIST

Series 5000 aluminum-magnesium alloys gain ground in welded structural uses. **P. 64**

Government's mercury purchase program has been slowed to a walk. **P. 66**

Distributors launch plan to promote U. S. machine tools. **P. 93**

COMPARISON OF PRICES

(Effective March 11, 1958)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	Mar. 11 1958	Mar. 4 1958	Feb. 11 1958	Mar. 12 1957
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.925¢	4.925¢	4.925¢	4.675¢
Cold-rolled sheets	6.05	6.05	6.05	5.75
Galvanized sheets (10 ga.)	6.60	6.60	6.60	6.30
Hot-rolled strip	4.925	4.925	4.925	4.675
Cold-rolled strip	7.17	7.17	7.17	6.870
Plate	5.12	5.12	5.12	4.87
Plates, wrought iron	13.15	13.15	13.15	10.40
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	50.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.30	$10.30	$10.30	$9.95
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	8.65
Special coated mfg. ternes	9.55	9.55	9.55	9.20
Bars and Shapes: (per pound)				
Merchant bar	5.425¢	5.425¢	5.425¢	5.075¢
Cold finished bars	7.30	7.30	7.30	6.85
Alloy bars	6.475	6.475	6.475	6.125
Structural shapes	5.275	5.275	5.275	5.00
Stainless bars (No. 302)	45.00	45.00	45.00	43.25
Wrought iron bars	14.45	14.45	14.45	11.50
Wire: (per pound)				
Bright wire	7.65¢	7.65¢	7.65¢	7.20¢
Rails: (per 100 lb.)				
Heavy rails	$5.525	$5.525	$5.525	$5.275
Light rails	6.50	6.50	6.50	6.25
Semifinished Steel: (per net ton)				
Rerolling billets	$77.50	$77.50	$77.50	$74.00
Slabs, rerolling	77.50	77.50	77.50	74.00
Forging billets	96.00	96.00	96.00	91.50
Alloy blooms, billets, slabs	114.00	114.00	114.00	107.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.15¢	6.15¢	6.15¢	5.80¢
Skelp	4.875	4.875	4.875	4.225
Finished Steel Composite: (per pound)				
Base price	5.967¢	5.967¢	5.967¢	5.670¢

	March 11 1958	March 4 1958	Feb. 11 1958	March 12 1957
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.97	$70.97	$70.51	$68.88
Foundry, Valley	66.50	66.50	66.50	65.00
Foundry, Southern Cin'ti	73.87	73.87	71.65	67.17
Foundry, Birmingham	62.50	62.50	62.50	59.00
Foundry, Chicago	66.50	66.50	66.50	65.00
Basic, del'd Philadelphia	70.47	70.47	70.01	68.38
Basic, Valley furnace	66.00	66.00	66.00	64.50
Malleable, Chicago	66.50	66.50	66.50	65.00
Malleable, Valley	66.50	66.50	66.50	65.00
Ferromanganese, 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	12.75
Pig Iron Composite: (per gross ton)				
Pig iron	$66.49	$66.49	$66.42	$64.68
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$37.50	$37.50	$36.50	$50.50
No. 1 steel, Phila. area	38.00	38.00	38.00	53.50
No. 1 steel, Chicago	*36.50*	37.50	37.50	44.50
No. 1 bundles, Detroit	**32.50**	31.50	29.50	42.50
Low phos., Youngstown	*38.50*	41.00	38.50	50.50
No. 1 mach'y cast, Pittsburgh	51.50	51.50	49.50	56.50
No. 1 mach'y cast, Phila.	**49.50**	48.50	47.50	57.50
No. 1 mach'y cast, Chicago	48.50	48.50	49.50	49.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	*$37.33*	$37.67	$37.33	$49.50
No. 2 bundles	28.50	28.50	29.17	40.50
Coke Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.38	$15.38	$15.38	$15.38
Foundry coke, prompt	$17.50-$19	$17.50-$19	$17.50-$19	$17.50-$19
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	25.00	25.00	25.00	32.00
Copper, Lake, Conn.	25.00	25.00	25.00	32.00
Tin, Straits, N. Y.	**95.75†**	94.75	93.00	98.75
Zinc, East St. Louis	10.00	10.00	10.00	13.50
Lead, St. Louis	12.80	12.80	12.80	15.80
Aluminum, virgin ingot	28.10	28.10	28.10	27.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	33.00	33.00

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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Chicago Price Break Drops Market

Price front creaks in the Midwest as No. 1 heavy melting declines a dollar.

Movement brings end to uneasy stalemate which had been controlling the market.

▪ Price drops in the Midwest finally punctured the market's recent gains.

The declines, while the No. 1 grades were unchanged in other steelmaking centers, were not unexpected. The market had been clinging unsteadily to its recent price gains. Without the support of increased steelmaking activity it had small chance of holding them.

The break finally came at Chicago where secondary grades had shown some weakness last week. This week those grades remained stable but the price of No. 1 heavy dropped by $1 down to $36 to $37. In other areas No. 1 heavy held firm although the dealer market had a weaker tone.

Composite Drops—Dealers in the Pittsburgh area were trying to hold out for existing prices and there was little activity in the Philadelphia market.

As a result of the decline at Chicago The IRON AGE No. 1 heavy melting Composite fell by 34 cents to $37.33. The No. 2 bundle Composite remained unchanged at $28.50.

For the first time, The IRON AGE is now quoting several grades of stainless steel scrap in Pittsburgh, Chicago, Cleveland, and New York.

Pittsburgh — Prices of secondary grades of openhearth scrap dropped $1 to $2 as a mill in a nearby district withdrew from the market. No. 1 heavy melting is holding firm although the whole dealer market has a weaker tone. Dealers are holding the price line for the best grades, but they show a little more readiness to do business. Early railroad lists showed little change from last month.

Chicago—A late break pushed the price of No. 1 heavy melting down by $1 to $36 to $37. No. 1 dealer bundles also declined by the same amount going for $36 to $37. The downward movement followed a period when the No. 1 grades had been holding at higher levels of $37 to $38. Broker offers to buy under previous consumer price levels were a factor in the change. Dealers tried to hold the price line, but were unsuccessful.

Philadelphia — Except for some small sales of foundry grades, there was little activity in the domestic market. The foundry buys sent prices of heavy breakable cast up $3 to $43 to $44, and malleable up $4 to $60-$62. There are no signs of an increase in the level of exports.

New York — Openhearth and blast furnace grades remain unchanged, with virtually all business in export. Mixed yard cast is up $2 to a top of $35 on a recent domestic sale. Stainless is fluid. Improperly prepared solids and dirty turnings continue to be a headache. The market for 430 turnings is quiet, with the largest customer not buying.

Detroit—Limited buying for the Canadian market has done little to bolster dealer market outlook. Not much support is expected this month from local mills. No. 1 cupola cast was incorrectly quoted last week. Correct price was $37 to $38.

Cleveland — The Valley market lost steam when a tonnage of No. 1 heavy melting dealer material was sold for $38, or $1 under previous prices. Railroad lists also sold for $2 off, thus adding to the downtrend. In Cleveland, a 2 ft foundry steel order at $39 was quickly covered with the help of a $4 springboard.

St. Louis—Mills are buying sparingly at present quoted prices. Movement is light. Processors are buying unstripped motor blocks because of the shortage of clean blocks. Rails random length and standard steel car axles are up $1.

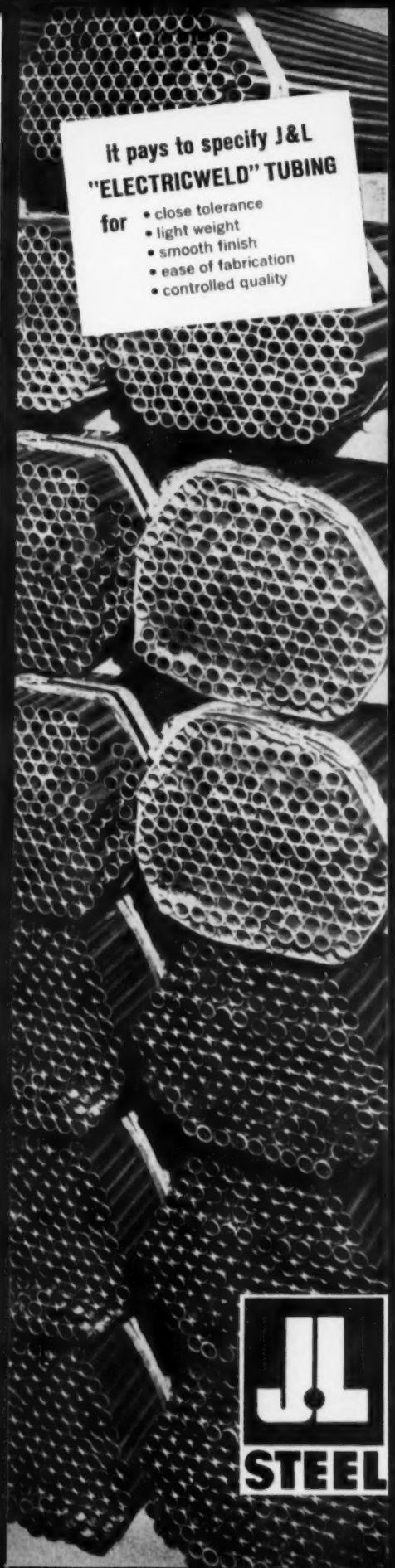
Birmingham — An Atlanta mill raised its price $2.60 a gross ton for No. 2 steel this week and was successful in getting all it wanted. Some electric furnace items responded to the advance in openhearth grades.

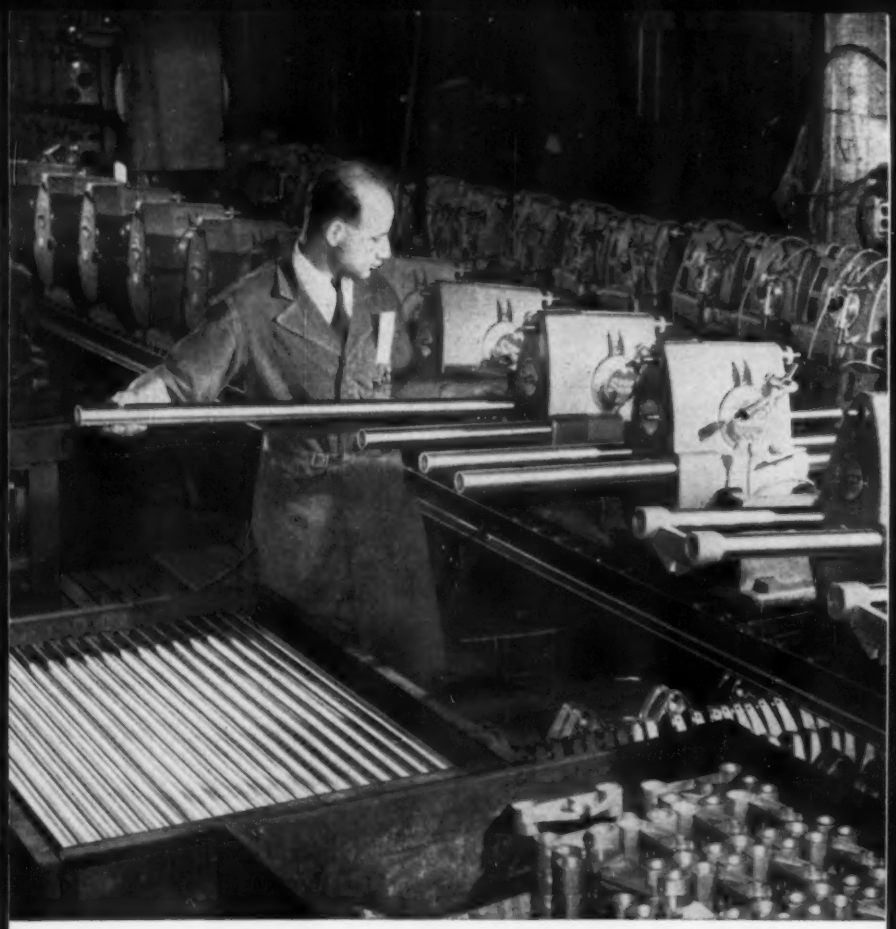
Cincinnati—Scrap movement is picking up with recovery of prices and return of good weather. Tonnage is still moving upriver from other areas, but the local price is expected to hold most local scrap. Foundry market is still dead because of strike and tonnage is going to other areas.

Buffalo—Arrival of better weather has increased the flow of scrap to dealer yards, but inventories remain far below normal. Two small sales of 2 ft and under structurals and plate were made at $37 to $38. Remainder of the market has been inactive and prices are unchanged.

Boston—Still no sign of life in this market. Buyers and sellers are sitting on their hands, waiting for a pickup in steel demand. No export business.

West Coast — Any increase in mill buying or exporting could hike prices. Very little scrap is in the yards. No. 1 cupola cast moved up $2 per ton in Los Angeles due to lack of supply.





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SCRAP PRICES *(Effective March 11, 1958)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	37.00 to 38.00
No. 1 factory bundles	41.00 to 42.00
No. 2 bundles	29.00 to 30.00
No. 1 busheling	37.00 to 38.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and ms. turn.	18.00 to 19.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	22.00 to 23.00
Low phos. punch'gs plate	41.00 to 42.00
Heavy turnings	33.00 to 34.00
No. 1 RR hvy. melting	41.00 to 42.00
Scrap rails, random lgth	51.00 to 52.00
Rails 2 ft and under	55.00 to 56.00
RR steel wheels	48.00 to 49.00
RR spring steel	48.00 to 49.00
RR couplers and knuckles	48.00 to 49.00
No. 1 machinery cast	51.00 to 52.00
Cupola cast	42.00 to 43.00
Heavy breakable cast	40.00 to 41.00
Stainless	
18-8 bundles and solids	185.00 to 190.00
18-8 turnings	110.00
430 bundles and solids	110.00 to 115.00
410 turnings	60.00

Chicago

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	36.00 to 37.00
No. 1 factory bundles	40.00 to 41.00
No. 2 bundles	27.00 to 28.00
No. 1 busheling	37.00 to 38.00
Machine shop turn.	20.00 to 21.00
Mixed bor. and turn.	22.00 to 23.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	22.00 to 23.00
Low phos. forge crops	49.00 to 50.00
Low phos. punch'gs plate	45.00 to 46.00
Low phos. 3 ft and under	43.00 to 44.00
No. 1 RR hvy. melting	40.00 to 41.00
Scrap rails, random lgth	49.00 to 50.00
Rerolling rails	55.00 to 56.00
Rails 2 ft and under	56.00 to 57.00
Locomotive tires cut	49.00 to 50.00
Cut boisters & side frames	46.00 to 47.00
Angles and splice bars	50.00 to 51.00
RR steel car axles	57.00 to 58.00
RR couplers and knuckles	46.00 to 47.00
No. 1 machinery cast	48.00 to 49.00
Cupola cast	41.00 to 42.00
Heavy breakable cast	39.00 to 40.00
Cast iron brake shoe	39.00 to 40.00
Cast iron wheels	36.00 to 37.00
Malleable	52.00 to 53.00
Stove plate	39.00 to 40.00
Steel car wheels	47.00 to 48.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	95.00 to 100.00
430 bundles and solids	100.00 to 110.00
430 turnings	50.00 to 55.00

Philadelphia Area

No. 1 hvy. melting	$37.50 to $38.50
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	37.50 to 38.50
No. 2 bundles	27.00 to 28.00
No. 1 busheling	37.50 to 38.50
Machine shop turn.	20.00 to 21.00
Mixed bor. short turn.	21.00 to 22.00
Cast iron borings	22.00 to 23.00
Shoveling turnings	22.00 to 23.00
Clean cast. chem. borings	32.00 to 33.00
Low phos. 5 ft and under	42.00 to 43.00
Low phos. 2 ft and under	43.00 to 44.00
Low phos. punch'gs	43.00 to 44.00
Elec. furnace bundles	39.00 to 40.00
Heavy turnings	33.00 to 34.00
RR steel wheels	45.00 to 46.00
RR spring steel	45.00 to 46.00
Rails 18 in. and under	58.00 to 60.00
Cupola cast	39.00 to 40.00
Heavy breakable cast	43.00 to 44.00
Cast iron car wheels	40.00 to 41.00
Malleable	60.00 to 62.00
Unstripped motor blocks	32.00 to 33.00
No. 1 machinery cast	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	28.50 to 29.50
No. 1 dealer bundles	32.00 to 33.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	15.00 to 16.00
Low phos. 18 in. and under	40.00 to 41.00
Rails, random length	44.00 to 45.00
Rails, 18 in. and under	54.00 to 55.00
No. 1 cupola cast	41.00 to 42.00
Hvy. breakable cast	33.00 to 34.00
Drop broken cast	47.00 to 48.00

Cleveland

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	34.00 to 35.00
No. 1 factory bundles	39.00 to 40.00
No. 2 bundles	25.00 to 26.00
No. 1 bushelings	34.00 to 35.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Cut struct'r'l & plates, 2 ft & under	42.00 to 43.00
Drop forge flashings	34.00 to 35.00
Low phos. punch'gs, plate	35.00 to 36.00
Foundry steel, 2 ft & under	38.00 to 39.00
No. 1 RR heavy melting	42.00 to 43.00
Rails 2 ft and under	56.00 to 57.00
Rails 18 in. and under	57.00 to 58.00
Railroad grate bars	17.00 to 18.00
Steel axle turnings	20.00 to 21.00
Railroad cast	49.00 to 50.00
No. 1 machinery cast	46.00 to 47.00
Stove plate	45.00 to 46.00
Malleable	60.00 to 61.00
Stainless	
18-8 bundles	165.00 to 170.00
18-8 turnings	90.00 to 95.00
430 bundles	100.00 to 105.00
430 turnings	40.00 to 45.00

Buffalo

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	25.50 to 26.50
No. 1 busheling	28.00 to 29.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	22.50 to 23.50
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	14.00 to 15.00
Low phos. plate	34.00 to 35.00
Structurals and plate, 2 ft and under	37.00 to 38.00
Scrap rails, random lgth	40.00 to 41.00
Rails 2 ft and under	50.00 to 51.00
RR steel wheels	37.00 to 38.00
RR spring steel	33.00 to 34.00
RR couplers and knucklers	33.00 to 34.00
No. 1 machinery cast	45.00 to 46.00
No. 1 cupola cast	40.00 to 41.00

St. Louis

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	23.00 to 24.00
Machine shop turn.	18.00 to 19.00
Cast iron borings	18.00 to 19.00
Shoveling turnings	20.00 to 21.00
No. 1 RR hvy. melting	38.00 to 39.00
Rails, random lengths	48.00 to 49.00
Rails, 18 in. and under	54.00 to 55.00
Angles and splice bars	47.00 to 48.00
Std. steel car axles	52.00 to 53.00
RR specialties	44.00 to 45.00
Cupola cast	45.00 to 46.00
Heavy breakable cast	32.00 to 33.00
Cast iron brake shoes	37.00 to 38.00
Stove plate	39.00 to 40.00
Cast iron car wheels	37.00 to 38.00
Rerolling rails	56.00 to 57.00
Unstripped motor blocks	35.00 to 36.00

Birmingham

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	33.00 to 34.00
Machine shop turn.	24.00 to 25.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	12.00 to 13.00
Electric furnace bundles	37.00 to 38.00
Elec. furnace, 3 ft & under	36.00 to 37.00
Bar crops and plate	40.00 to 41.00
Structural and plate, 2 ft	39.00 to 40.00
No. 1 RR hvy. melting	36.00 to 37.00
Scrap rails, random lgth	45.00 to 46.00
Rails, 18 in. and under	49.00 to 50.00
Angles & splice bars	43.00 to 44.00
Rerolling rails	52.00 to 53.00
No. 1 cupola cast	50.00 to 51.00
Stove plate	49.00 to 50.00
Charging box cast	22.00 to 23.00
Cast iron car wheels	39.00 to 40.00
Unstripped motor blocks	40.00 to 41.00

Youngstown

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	28.00 to 29.00
Machine shop turn.	14.00 to 15.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Low phos. plate	38.00 to 39.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	29.00 to 30.00
No. 2 dealer bundles	24.00 to 25.00
Machine shop turn.	11.00 to 12.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Clean cast. chem. borings	25.00 to 26.00
No. 1 machinery cast	34.00 to 35.00
Mixed yard cast	34.00 to 35.00
Charging box cast	30.00 to 31.00
Heavy breakable cast	30.00 to 31.00
Unstripped motor blocks	27.00 to 28.00
Stainless	
18-8 prepared solids	155.00 to 160.00
18-8 turnings	60.00 to 65.00
430 prepared solids	75.00 to 80.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	32.00 to 33.00
Drop forge flashings	28.00 to 29.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	13.00 to 14.00
Low phos. punch'gs plate	30.00 to 31.00
No. 1 cupola cast	37.00 to 38.00
Heavy breakable cast	31.00 to 32.00
Stove plate	31.00 to 32.00
Automotive cast	39.00 to 40.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	23.00 to 24.00
No. 1 dealer bundles	26.00 to 27.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	26.00 to 27.00
Elec. furnace, 3 ft & under	31.00 to 32.00
Machine shop turn.	9.00 to 10.00
Mixed bor. and short turn.	9.00 to 10.00
Shoveling turnings	11.00 to 12.00
Clean cast. chem. borings	19.00 to 20.00
No. 1 machinery cast	34.00 to 35.00
Mixed cupola cast	30.00 to 31.00
Heavy breakable cast	29.00 to 30.00
Stove plate	26.00 to 27.00
Unstripped motor blocks	26.00 to 27.00

San Francisco

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	28.00
No. 2 bundles	22.00
Machine shop turn.	15.00
Cast iron borings	15.00
No. 1 RR hvy. melting	32.00
No. 1 cupola cast	40.00

Los Angeles

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	32.00
No. 1 dealer bundles	30.00
No. 2 bundles	22.00
Machine shop turn.	$9.00 to 11.00
Shoveling turnings	11.00 to 13.00
Cast iron borings	11.00 to 13.00
Elec. furn. 1 ft and under (foundry)	45.00
No. 1 RR hvy. melting	36.00
No. 1 cupola cast	40.00 to 42.00

Seattle

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	30.00
No. 2 bundles	24.00
No. 1 cupola cast	36.00
Mixed yard cast	36.00

Hamilton, Ont.

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	28.00
No. 1 dealer bundles	32.00
No. 2 bundles	25.00
Mixed steel scrap	27.00
Busheling	22.00
Bush., new fact, prep'd	32.00
Bush., new fact, unprep'd	26.00
Machine shop turn.	17.00
Short steel turn.	21.00
Mixed bor. and turn.	17.00
Rails, rerolling	41.00
Cast scrap	$44.00 to 47.00

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Zinc Market Is At Rock Bottom

February business was bad, but trade breathes a sigh as March holds at the same level.

Producers and smelters say this is the floor.

But no upturn is expected until the economic atmosphere begins to clear.

▪ There is a slight trace of cautious optimism in the zinc industry this week. But it's not because business is any better.

Major producers and smelters say there are definite signs the market has taken the first step toward recovery. It has hit bottom. Consensus is that sales and shipments will stay about where they are now until the overall business picture starts to firm up.

Inventory Cutting Over — One producer notes that rush orders are becoming more common. He interprets this hand-to-mouth buying to mean inventory cutting by customers is about over.

The sales manager of a smelter says sales in March just about held February levels. He believes customers' inventories are scraping the bottom of the barrel. The only thing that will move the market now, he says, is a pickup in demand for his customers' products.

A salesman working a midwest territory for a producer notes some increase in his sales since March 1. But he attributes this to the end of inventory cutting rather than improved conditions. He also sees no increase in orders until the economic atmosphere clears.

Little Tariff Interest—There is much less interest in the impending report from the U. S. Tariff Commission on higher duties for imported lead and zinc. Most factors in the market concede the higher tariff will be recommended and applied. But this is expected to have little if any effect on the tone of the market.

The report of February activity from the American Zinc Institute was certainly no grounds for optimism. The only thing up was stocks on hand at smelters at the end of the month. Both production and shipments were off noticeably.

	Feb. 1958	Jan. 1958
Production	**68,354**	**82,343**
Shipments	**59,511**	**68,657**
Stocks at smelters (short tons)	**189,189**	**180,346**

Copper

In a move to try and stem the increasing pressure for a lower price, Kennecott Copper Co. again cut production at its four western U. S. divisions.

The work week is being reduced from six to five days. This will drop output by about 12 pct, and combined with other cuts puts Kennecott's U. S. production at about 80 pct of previous capacity operations.

Nickel

The political tinderbox in Cuba has apparently had little effect on plans for the nickel installations on the island.

The General Services Administration has not asked for bids in its attempt to sell the government-owned plant at Nicaro, Cuba. But a spokesman said about 14 firms have expressed interest, will probably be heard from when the bidding opens.

Delay in Selling—GSA says the delay has been caused by (1) potential bidders asking for time to inspect the facilities, and (2) negotiations between the U. S. and Cuba over whether the buyer will be subject to the high duties on fuel, from which the government is exempt.

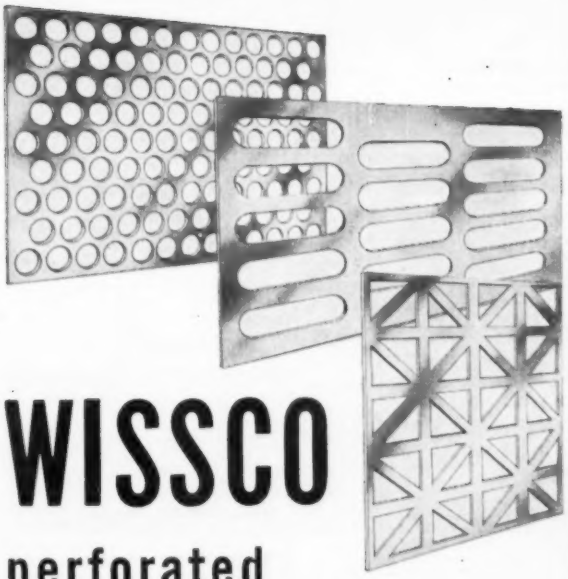
Building Proceeds—Freeport Sulphur Co. reports work on its $119 million nickel-cobalt project at Moa Bay, Cuba is moving right along. The installation is in Oriente Province, controlled by the rebel leader Fidel Castro. But a Freeport spokesman pointed out that his headquarters is on the opposite side of the island with no decent roads between the two.

Tin prices for the week; March 5—95.25; March 6—95.75; March 7—96.125; March 10—95.875; March 11—95.75.*
*Estimate

Primary Prices

(cents per lb)	Current price	last price	date of change
Aluminum pig	26.00	25.00	8/1/57
Aluminum ingot	28.10	27.10	8/1/57
Copper (E)	25.00	27.00	1/13/58
Copper (CS)	23.00	23.50	2.26.58
Copper (L)	25.00	27.00	1/13/58
Lead, St. L.	12.80	13.30	12/2/57
Lead, N. Y.	13.00	13.50	12/2/57
Magnesium ingot	38.00	34.00	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	64.50	12/6/56
Titanium sponge	200 250	165 250	1/29/58
Zinc, E. St. L.	10.00	10.50	7/1/57
Zinc, N. Y.	10.80	11.00	7/1/57

ALUMINUM: 99% ingot frt allwd. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig. Velasco, Tex. NICKEL: Port Colbourne, Canada. ZINC: prime western. TIN: see above; other primary prices, pg. 166.



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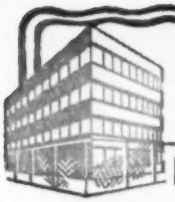

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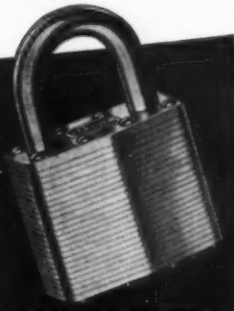

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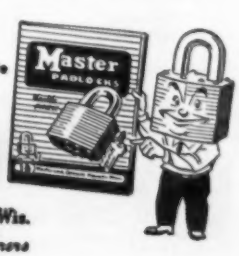

Master Padlocks

Master Lock Company, Milwaukee 45, Wis.
World's Largest Padlock Manufacturers

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	.032	.081	.136-.249	.250-3.
1100, 3003	46.6	44.3	43.6	42.7
5052	54.0	48.9	47.2	45.4
6061-0	51.4	47.0	45.2	45.1

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6- 8	45.0-46.8	60.4-64.1
12-14	45.7-47.2	61.3-65.8
24-26	49.0-49.5	72.1-76.8
36-38	58.0-58.6	96.2-99.8

Screw Machine Stock—2011-T-3

Size"	¼	⅜-⅝	¾-1	1¼-1½
Price	63.0	62.5	61.0	58.6

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.420	$1.893	$2.367	$2.839
.024 gage	1.774	2.366	2.957	3.549

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	108.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade... (AZ31B)	84.6	85.7	90 6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	48.13	.....	45.36	48.32
Brass, 70/30	42.69	43.23	42.63	45.60
Brass, Low	44.90	45.44	44.84	47.71
Brass, R L	45.67	46.21	45.61	48.48
Brass, Naval	47.07	.....	41.38	50.48
Munts Metal	45.19	.....	41.00	.....
Comm. Bz.	46.98	47.52	46.92	49.54
Mang. Bz.	50.81	.....	44.91	.....
Phos. Bz. 5%	67.17	.....	67.67	.....

Free Cutting Brass Rod 31.03

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $9.50-$10.60; alloy, $14.75; Plate, HR, commercially pure, $8.00-$8.75; alloy, $10.75. Wire, rolled and/or drawn, commercially pure, $7.50-$8.00; alloy, $10.00, Bar, HR or forged, commercially pure, $6.15-$6.40; alloy, $6.15-$6.35; billets, HR, commercially pure, $6.00-$6.25; alloy, $5.80-$6.20.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 29.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.55
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic basis ... $ 1.31
Cobalt, 97-99% (per lb) ..$2.00 to $2.07
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 39.50 to 50.00
Gold, U. S. Treas, per troy oz. $35.00
Indium, 99.9%, dollars per troy oz..$ 2.25
Iridium, dollars per troy oz. ...$80 to $90
Lithium, 98% .....$11.00 to $14.00
Magnesium, sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York .....$227 to $235
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 71.25
Palladium, dollars per troy oz...$19 to $21
Platinum, dollars per troy oz...$72 to $75
Rhodium .....$120.00 to $125.00
Silver ingots (¢ per troy oz.)..... 88.625
Thorium, per kg. $43.00
Vanadium ..... $ 3.45
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 24.75
No. 120 ..... 23.75
No. 122 ..... 23.00
80-10-10 ingot
No. 305 ..... 28.75
No. 315 ..... 26.75
88-10-2 ingot
No. 210 ..... 35.75
No. 215 ..... 31.50
No. 245 ..... 28.25
Yellow ingot
No. 405 ..... 20.75
Manganese bronze
No. 421 ..... 22.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 24.75-25.75
0.60 copper max. 24.50-25.50
Piston alloys (No. 122 type)..23.75-24.50
No. 12 alum. (No. 2 grade) ...21.00-21.75
108 alloy 21.25-22.25
195 alloy 24.00-25.50
13 alloy (0.60 copper max.) ..24.50-25.50
AXS-679 .....21.25-22.25

(Effective March 10, 1958)

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% 22.00-23.00
Grade 2—92-95% 21.00-21.75
Grade 3—90-92% 20.00-20.75
Grade 4—85-90% 17.50-18.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	21	20¼
Yellow brass	16⅛	14⅛
Red brass	18⅛	17⅛
Comm. bronze	19⅛	18⅛
Mang. bronze	14⅞	14⅛
Yellow brass rod ends	15⅝	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 18¾
No. 2 copper wire 17¼
Light copper 15
*Refinery brass 16⅜
Copper bearing material 16¼
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 18¾
No. 2 copper wire 17¼
Light copper 15
No. 1 composition 17
No. 1 comp. turnings 16⅛
Hvy. yellow brass solids 12
Brass pipe 13¾
Radiators 13

Aluminum

Mixed old cast. ..... 12½—13½
Mixed new clips ..... 14½—15½
Mixed turnings, dry ..... 13 —14

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 16½—17
No. 2 copper wire ..... 14½—15
Light copper ..... 12½—13
Auto radiators (unsweated).. 10½—11
No. 1 composition ..... 14 —14½
No. 1 composition turnings.. 13 —13½
Cocks and faucets ..... 11½—12
Clean heavy yellow brass ... 9½—10
Brass pipe ..... 11½—12
New soft brass clippings .... 12½—13
No. 1 brass rod turnings .... 10 —10½

Aluminum

Alum. pistons and struts .... 5½— 6
Aluminum crankcases ..... 10 —10½
1100 (2S) aluminum clippings 13 —13½
Old sheet and utensils ..... 10 —10½
Borings and turnings ..... 6½— 7
Industrial castings ..... 10 —10½
2024 (24S) clippings ..... 11½—12

Zinc

New zinc clippings ..... 4 — 4½
Old zinc ..... 3 — 3¼
Zinc routings ..... 1¾— 2
Old die cast scrap ..... 1½— 1¾

Nickel and Monel

Pure nickel clippings 42-45
Clean nickel turnings 37-40
Nickel anodes 42-45
Nickel rod ends 42-45
New Monel clippings 28-29
Clean Monel turnings 20-23
Old sheet Monel 25-26
Nickel silver clippings, mixed. 18
Nickel silver turnings, mixed. 15

Lead

Soft scrap lead ..... 8½— 9
Battery plates (dry) ..... 3½— 3¾
Batteries, acid free ..... 2½— 2¾

Miscellaneous

Block tin ..... 75 —76
No. 1 pewter ..... 59 —60
Auto babbitt ..... 39 —40
Mixed common babbitt ..... 11 —11½
Solder joints ..... 14½—15
Siphon tops 42
Small foundry type ..... 12 —12¼
Monotype ..... 12 —12½
Lino. and stereotype ..... 11 —11¼
Electrotype ..... 10 —10¼
Hand picked type shells .... 7 — 7½
Lino. and stereo. dross ..... 3 — 3¼
Electro dross ..... 2½— 2¾

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$114.00 *B3*		5.325 *B3*	7.80 *B3*	5.325 *B3*						
	Buffalo, N. Y.	$77.50 *R3, B3*	$96.00 *R3, B3*	$114.00 *R3, B3*	6.225 *B3*	5.325 *B3*	7.80 *B3*	5.325 *B3*	4.925 *R3, B3*	7.15 *S10*	7.325 *B3*			
	Phila., Pa.									7.70 *P15*				
	Harrison, N. J.													15.05 *C11*
	Conshohocken Pa.		$101.00 *A2*	$121.00 *A2*					4.975 *A2*	7.20 *A2*	7.325 *A2*			
	New Bedford, Mass.									7.60 *R6*				
	Johnstown, Pa.	$77.50 *B3*	$96.00 *B3*	$114.00 *B3*		5.325 *B3*	7.80 *B3*							
	Boston, Mass.									7.70 *T8*				15.40 *T8*
	New Haven, Conn.									7.60 *D1*				
	Baltimore, Md.									7.15 *T8*				
	Phoenixville, Pa.					5.325 *P2*		5.325 *P2*						
	Sparrows Pt., Md.								4.925 *B3*		7.325 *B3*			
	Bridgeport, Wallingford, Conn.			$114.00 *N8*						7.60 *W1*				
	Pawtucket, R. I. Worcester, Mass.									7.70 *N7* 7.70 *A5*				15.40 *N7* 15.20 *T8*
MIDDLE WEST	Alton, Ill.								5.125 *L1*					
	Ashland, Ky.								4.925 *A7*					
	Canton-Massillon, Dover, Ohio		$96.00 *R3*	$114.00 *R3, T5*						7.15 *G4*		10.45 *G4*		14.85 *C11*
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	$77.50 *U1, R3*	$96.00 *U1, R3,W8*	$114.00 *U1, R3,W8*	6.225 *U1*	5.275 *U1, W8,P13*	7.75 *U1,Y1 W8*	5.275 *U1*	4.925 *W8, N4,A1*	7.25 *A1,T8 M8*			8.10 *W8, S9,I3*	15.05 *A1, S9,G4*
	Cleveland, Ohio									7.15 *A5,J3*		10.45 *A5*	8.10 *J3*	
	Detroit, Mich.			$114.00 *R5*					5.025 *G3, M2*	7.25 *M2,D1, D2,G3,P11*	7.425 *G3*	10.60 *D2* 10.55 *G3*	8.10 *G3*	
	Anderson, Ind.									7.15 *G4*				
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$77.50 *U1*	$96.00 *U1*	$114.00 *U1, Y1*		5.275 *U1, I3*	7.75 *U1, I3*	5.275 *I3*	4.925 *U1, I3,Y1*	7.15 *Y1*	7.325 *U1, I3,Y1*	10.60 *Y1*	8.10 *U1, Y1*	
	Sterling, Ill.	$77.50 *N4*				5.275 *N4*			5.025 *N4*					
	Indianapolis, Ind.									7.30 *J3*				15.20 *J3*
	Newport, Ky.												8.10 *A9*	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$96.00 *S1, C10*	$114.00 *C10,S1*					4.925 *R3, S1*	7.15 *R3,T4 S1*	7.325 *R3, S1*	10.50 *S1* 10.45 *R3*	8.10 *S1*	15.05 *S1*
	Owensboro, Ky.	$77.50 *G5*	$96.00 *G5*	$114.00 *G5*										
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Aliquippa, Pa.	$77.50 *U1, P6*	$96.00 *U1, C11,P6*	$114.00 *U1, C11,B7*	6.225 *U1*	5.275 *U1, J3*	7.75 *U1, J3*	5.275 *U1*	4.925 *P6*	7.15 *J3,B4, S7*			8.10 *S9*	15.05 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.225 *W3*	5.275 *W3*			4.925 *W3*	7.15 *W3,F3*	7.325 *W3*	10.50 *W3*		
	Youngstown, Ohio	$77.50 *R3*	$96.00 *Y1, C10*	$114.00 *Y1*			7.75 *Y1*			7.15 *Y1,J3*	7.325 *U1, Y1*	10.65 *Y1*	8.10 *U1, Y1*	15.05 *J3* 10.65 *Y1*
WEST	Fontana, Cal.	$88.00 *K1*	$105.50 *K1*	$135.00 *K1*		6.075 *K1*	8.55 *K1*	6.225 *K1*	5.675 *K1*	9.00 *K1*				
	Geneva, Utah		$96.00 *C7*			5.275 *C7*	7.75 *C7*							
	Kansas City, Mo.					5.375 *S2*	7.85 *S2*						8.35 *S2*	
	Los Angeles, Torrance, Cal.		$105.50 *B2*	$134.00 *B2*		5.975 *C7, B2*	8.45 *B2*		5.675 *C7, B2*	9.05 *J3*			9.30 *B2*	17.25 *J3*
	Minnequa, Colo.					5.575 *C6*			6.025 *C6*	9.10 *K1*				
	Portland, Ore.					6.025 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$105.50 *B2*			5.925 *B2*	8.40 *B2*		5.675 *C7, B2*					
	Seattle, Wash.		$109.50 *B2*			6.025 *B2*	8.50 *B2*		5.925 *B2*					
SOUTH	Atlanta, Ga.					5.475 *A8*			5.125 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$77.50 *T2*	$96.00 *T2*			5.275 *T2, R3,C16*	7.75 *T2*		4.925 *T2, R3,C16*		7.325 *T2*			
	Houston, Lone Star, Texas		$101.00 *S2*	$119.00 *S2*		5.375 *S2*	7.85 *S2*						8.35 *S2*	

(Effective March 10, 1958)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.			Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.925 *B3*	6.05 *B3*				7.275 *B3*	8.975 *B3*			6.15 *W6*	† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.975 *A2*	6.10 *A2*				7.325 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										6.15 *B3*			
	Fairless, Pa.	4.975 *U1*	6.10 *U1*				7.325 *U1*	9.025 *U1*				$10.15 *U1*	$8.85 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.925 *B3*	6.05 *B3*	6.60 *B3*			7.275 *B3*	8.975 *B3*	9.725 *B3*		6.25 *B3*	$10.15 *B3*	$8.85 *B3*	
	Worcester, Mass.										6.45 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										6.35 *L1*			
	Ashland, Ky	4.925 *A7*		6.60 *A7*	6.625 *A7*									
	Canton-Massillon, Dover, Ohio			6.60 *R3, R1*										
	Chicago, Joliet, Ill.	4.925 *W8, A1*					7.275 *U1*				6.15 *A5, R3, W8, N4, K2*			
	Sterling, Ill.										6.25 *N4, K2*			
	Cleveland, Ohio	4.925 *R3, J3*	6.05 *R3, J3*		6.625 *R3*		7.275 *R3, J3*	8.975 *R3, J3*			6.15 *A5*			
	Detroit, Mich.	5.025 *G3, M2*	6.15 *G3* 6.05 *M2*				7.375 *G3*	9.075 *G3*						
	Newport, Ky	4.925 *A1*	6.05 *A1*											
	Gary, Ind. Harbor, Indiana	4.925 *U1, I3, Y1*	6.05 *U1, I3, Y1*	6.60 *U1, I3*	6.625 *U1, I3, Y1*	7.00 *U1*	7.275 *U1, Y1, I3*	8.975 *U1, Y1*			6.15 *Y1*	$10.05 *U1, Y1*	$8.75 *I3, U1, Y1*	7.50 *U1, Y1*
	Granite City, Ill.	5.125 *G2*	6.25 *G2*	6.80 *G2*	6.825 *G2*								$8.85 *G2*	7.60 *G2*
	Kokomo, Ind.			6.70 *C9*							6.25 *C9*			
	Mansfield, Ohio		6.05 *E2*			7.00 *E2*								
	Middletown, Ohio		6.05 *A7*	6.60 *A7*	6.625 *A7*	7.00 *A7*								
	Niles, Warren, Ohio Sharon, Pa.	4.925 *R3, N3, S1*	6.05 *R3*	6.60 *R3*	6.625 *N3, S1*	7.00 *N3, S1, R3*	7.275 *R3*	8.975 *S1, R3*					$8.75 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donora, Pa. Aliquippa, Pa.	4.925 *U1, J3, P6*	6.05 *U1, J3, P6*	6.60 *U1, J3*	6.625 *U1*		7.275 *U1, J3*	8.975 *U1, J3*	9.725 *U1*		6.15 *A5, J3, P6*	$10.05 *U1, J3*	$8.75 *U1, J3*	7.50 *U1, J3*
	Portsmouth, Ohio	4.925 *P7*	6.05 *P7*								6.15 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.925 *W3, W5*	6.05 *W3, F3, W5*	6.60 *W3, W5*		7.00 *W3, W5*	7.275 *W3*	8.975 *W3*				$10.05 *W5, W3*	$8.75 *W5, W3*	7.50 *W5*
	Youngstown, Ohio	4.925 *U1, Y1*	6.05 *Y1*		6.625 *Y1*		7.275 *Y1*	8.975 *Y1*			6.15 *Y1*			
WEST	Fontana Cal.	5.675 *K1*	7.30 *K1*				8.025 *K1*	10.275 *K1*				$10.80 *K1*	$9.50 *K1*	
	Geneva, Utah	5.025 *C7*												
	Kansas City, Mo.										6.40 *S2*			
	Los Angeles, Torrance, Cal.										6.95 *B2*			
	Minnequa, Colo.										6.40 *C6*			
	San Francisco, Niles, Pittsburgh, Cal.	5.625 *C7*	7.00 *C7*	7.35 *C7*							6.95 *C7*	$10.80 *C7*	$9.50 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.925 *T2, R3*	6.05 *T2, R3*	6.60 *T2, R3*	6.625 *T2*						6.15 *T2, R3*	$10.15 *T2*	$8.85 *T2*	
	Houston, Tex.										6.40 *S2*			

(Effective March 10, 1958)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfrs'. Bright
EAST	Bethlehem, Pa.				6.475 *B3*	8.775 *B3*	7.925 *B3*					
	Buffalo, N. Y.	5.425 *R3,B3*	5.425 *R3,B3*	7.35 *B5*	6.475 *B3,R3*	8.775 *B3,B5*	7.925 *B3*	5.10 *B3*		7.20 *B3*		7.65 *W6*
	Claymont, Del.							5.10 *C4*		7.20 *C4*	7.625 *C4*	
	Coatesville, Pa.							5.10 *L4*		7.20 *L4*	7.925 *L4*	
	Conshohocken, Pa.							5.20 *A2*	6.175 *A2*	7.20 *A2*	7.625 *A2*	
	Harrisburg, Pa.							5.10 *P2*	6.275 *P2*			
	Milton, Pa.	5.575 *M7*	5.575 *M7*									
	Hartford, Conn.			7.80 *R3*		9.075 *R3*	7.925 *B3*					
	Johnstown, Pa.	5.425 *B3*	5.425 *B3*		6.475 *B3*			5.10 *B3*		7.20 *B3*	7.625 *B3*	7.65 *B3*
	Fairless, Pa.	5.575 *U1*	5.575 *U1*		6.625 *U1*							
	Newark, N. J. Camden, N. J.			7.75 *W10* 7.75 *P10*		8.95 *W10* 8.95 *P10*						
	Bridgeport, Conn. Putnam, Conn. Willimantic, Conn.			7.85 *W10* 7.80 *J3*	6.55 *N8*	8.925 *N8*						
	Sparrows Pt., Md.		5.425 *B3*					5.10 *B3*		7.20 *B3*	7.625 *B3*	7.75 *B3*
	Palmer, Worcester, Readville, Mass. Mansfield, Mass.			7.85 *B5,C14*		9.075 *A5,B5*						7.95 *A5, W6*
	Spring City, Pa.			7.75 *K4*		8.95 *K4*						
MIDDLE WEST	Alton, Ill.	5.625 *L1*										7.85 *L1*
	Ashland, Newport, Ky.							5.10 *A7,A1*		7.20 *A1*		
	Canton, Massillon, Ohio			7.30 *R3,R2*	6.475 *R3,T5*	8.775 *R3,R2, T5*						
	Chicago, Joliet, Waukegan, Ill. Harvey, Ill.	5.425 *U1,R3, W8,N4,P13*	5.425 *U1,R3, N4,P13*	7.30 *A5, W10,W8 B5,L2,N9*	6.475 *U1,R3, W8*	8.775 *A5, W10,W8 L2,N8,B5*	7.925 *U1,W8*	5.10 *U1,A1, W8,I3*	6.175 *U1*	7.20 *U1,W8*	7.625 *U1,W8*	7.65 *A5,R3, W8,N4, K2,W7*
	Cleveland, Ohio Elyria, Ohio	5.425 *R3*	5.425 *R3*	7.30 *A5,C13 C18*		8.775 *A5, C13, C18*	7.925 *R3*	5.20 *R3,J3*	6.175 *J3*		7.625 *R3, J3*	7.65 *A5, C13*
	Detroit, Mich.	5.525 *G3*	5.775 *G3*	7.55 *P3* 7.50 *P8,B5*	6.475 *R5* 6.575 *G3*	8.775 *R5* 8.975 *B5,P3, P8*	8.025 *G3*	5.20 *G3*		7.35 *G3*		
	Duluth, Minn.											7.65 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.425 *U1,I3, Y1*	5.425 *U1,I3, Y1*	7.30 *R3,J3*	6.475 *U1,I3, Y1*	8.775 *R3,M4*	7.925 *U1, Y1*	5.10 *U1,I3, Y1*	6.175 *J3,I3*	7.20 *U1,Y1*	7.625 *U1, Y1,I3*	7.75 *M4*
	Granite City, Ill.							5.30 *G2*				
	Kokomo, Ind											7.75 *C9*
	Sterling, Ill.	5.525 *N4*	5.525 *N4*					5.10 *N4*				7.75 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.30 *C10*	6.475 *C10,S1*	8.775 *C10*	7.925 *S1*	5.10 *R3,S1*		7.20 *S1*	7.625 *R3, S1*	
	Owensboro, Ky.	5.425 *G5*			6.475 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.425 *U1,J3*	5.425 *U1,J3*	7.30 *A5,B4, R3,J3,C11, W10,S9,C8*	6.475 *U1,J3, C11,B7*	8.775 *A5, W10,R5,S9, C11,C8*	7.925 *U1,J3*	5.10 *U1,J3*	6.175 *U1*	7.20 *U1,J3, B7*	7.625 *U1,J3, B7*	7.65 *A5, J3,P6*
	Portsmouth, Ohio											7.65 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.10 *W5*				
	Youngstown, Ohio	5.425 *U1,R3, Y1*	5.425 *U1,R3, Y1*	7.30 *A5,Y1, F2*	6.475 *U1,Y1*	8.775 *Y1,F2*	7.925 *U1,Y1*	5.10 *U1,R3, Y1*		7.20 *Y1*	7.625 *U1, R3,Y1*	7.65 *Y1*
WEST	Emeryville, Cal. Fontana, Cal.	6.175 *J5* 6.125 *K1*	6.175 *J5* 6.125 *K1*		7.525 *K1*		8.625 *K1*	5.90 *K1*		8.00 *K1*	8.425 *K1*	
	Geneva, Utah							5.10 *C7*			7.625 *C7*	
	Kansas City, Mo.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*					7.90 *S2*
	Los Angeles, Torrance, Cal.	6.125 *C7,B2*	6.125 *C7,B2*	8.75 *R3,P14*	7.525 *B2*	10.75 *P14*	8.625 *B2*					8.60 *B2*
	Minnequa, Colo.	5.875 *C6*	5.875 *C6*					5.95 *C6*				7.90 *C6*
	Portland, Ore.	6.175 *O2*	6.175 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.125 *C7* 6.175 *B2*	6.125 *C7* 6.175 *B2*				8.675 *B2*					8.60 *C7,C6*
	Seattle Wash.	6.175 *B2,N6*	6.175 *B2*				8.675 *B2*	6.00 *B2*		8.10 *B2*	8.525 *B2*	
SOUTH	Atlanta, Ga.	5.625 *A8*	5.625 *A8*									7.85 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.425 *T2,R3, C16*	5.425 *T2,R3, C16*	7.90 *C16*			7.925 *T2*	5.10 *T2,R3*			7.625 *T2*	7.65 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*	5.20 *S2* 5.20 *L3*		7.30 *S2*	7.725 *S2*	7.90 *S2*

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 J. & L. Steel Co., Stainless Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Youngstown *R3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fontana *K1*	+8.25	+23.5	+5.25	+19.5	+1.75	+15.00	0.75	+14.25	1.25	+13.25	1.75	+12.75	3.25	+13.00								
Pittsburgh *J3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Alton, Ill. *L1*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Sharon *M3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fairless *N2*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Pittsburgh *N1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Wheeling *W5*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Wheatland *W4*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Youngstown *Y1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Indiana Harbor *Y1*	4.25	+11.0	7.25	+7.0	10.75	+2.50	13.25	+1.75	13.25	+0.75	14.25	+0.25	15.75	+1.00								
Lorain *N2*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Youngstown *R3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Fairless *N2*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Fontana *K1*	+3.75		0.25		3.25		3.75		4.25		4.75		5.25									
Pittsburgh *J3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Alton, Ill. *L1*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Sharon *M3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Pittsburgh *N1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Wheeling *W5*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Wheatland *W4*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Youngstown *Y1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Indiana Harbor *Y1*	8.75	+5.0	12.75	+1.0	15.75	3.50	16.25	2.25	16.75	3.25	17.25	3.75	17.75	2.50								
Lorain *N2*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50

Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower d'acounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 10¢ per lb.

(Effective March 10, 1958)

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
½" and smaller x 6" and shorter	49	54	56	57
⅝" thru 1" x longer than 6"	35	40	43	45
Rolled thread carriage bolts ½" & smaller x 6" and shorter	49	54	56	57
Lag, all diam. x 6" & shorter	49	54	56	57
Lag, all diam. longer than 6 in.	39	44½	47	48½
Plow bolts, ½" and smaller x 6" and shorter	49	54	56	57

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	60½
⅞ in. to 1 in. inclusive	55½
1⅛ in. to 1½ in. inclusive	58½
1⅝ in. and larger	53½
C. P. Hex, reg. & hvy.	
¾ in. and smaller	60½
⅞ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	46½
Semi-finished Hex Nuts	
⅝ in. or smaller	60½
¾ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
(Add 25 pct for broken case or keg quantities)	
Finished	
⅞ in. and smaller	63

Rivets

Base per 100 lb

½ in. and larger $12.25

Pct. Off List

7/16 in. and smaller 19

Cap Screws

	Discount (Packages) *Full Finished H. C. Heat Treat*	
New std. hex head, packaged		
⅝" diam. and smaller x 6" and shorter	40	26
¾", ⅞", and 1" diam. x 6" and shorter	22	3
⅝" diam. and smaller x longer than 6"	8	+13
¾", ⅞", and 1" diam. x longer than 6"	+ 6	+32
	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	58	49
¾" through 1" dia. x 6" and shorter	45	33

Minimum quantity—¼" through ⅜" diam., 15,000 pieces; 1/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

		Discount Mach. Screws	Stove Bolts
Plain Finish Cartons		60	60
Bulk	*Quantity*		
To ⅛" diam. incl.	25,000-and over	60	..
5/16 to ⅜" diam. incl.	15,000-200,000	60	..

Machine Screws & Stove Bolt Nuts

		Discount Hex	Square
In Cartons		16	19
In Bulk	*Quantity*		
¾" diam. & smaller	25,000 and over	14	16

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.7
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1953. value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	42.00
Electrodeposited	33.25
Brass, 80-20, ball anodes, 2000 lb or more	44.00
Zinc, ball anodes, 2000 lb lots	16.50
(for elliptical add 1¢ per lb)	
Nickel, 99 pct plus, rolled carbon, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.55
Tin, ball anodes $1.13 per lb (approx.).	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	71.70
Copper sulphate, 100 lb bags, per cwt.	24.35
Nickel salts, single, 100 lb bags	40.50
Nickel chloride, freight allowed, 300 lb	48.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	24.05
(Philadelphia price 24.50)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum N. Y.	48.00
Chromic acid, flake type, 10,000 lb or more	31.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots for minus 100 mesh

Swedish sponge iron, del. East of Miss. River, ocean bags, 23,000 lb. and over	10.5¢
F.O.B. Riverton or Camden, New Jersey, freight allowed west of Miss. River	9.5¢
Domestic sponge iron, 98+% Fe, 23,000 lb. and over del'd East of Miss. River	10.5¢
F.O.B. Riverton, New Jersey, West of Miss. River	9.5¢
Canadian sponge iron, del'd in East, carloads	10.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	27.0¢
Carbonyl iron size 3 to 20 micron, 98%, 99.8+% Fe	88.0¢ to $2.85
Aluminum, freight allowed	38.00¢
Brass, 10 ton lots	31.1¢ to 47.1¢
Copper, electrolytic	41.50¢
Copper, reduced	40.3¢ to 48.8¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99.85% min. Fe. 03 max. Del'd	$5.00
Lead	21.50¢ lb, f.o.b. plant
Manganese f.o.b. Extron, Pa.	46.0¢
Molybdenum, 99%	$3.60 to $3.95
Nickel, chemically precipitated	$1.05
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed #80	$1.13
Silicon	43.50¢
Solder powder	13¢ plus met. value
Stainless steel, 302	$1.02
Stainless steel, 316	$1.30
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$3.75 (nominal)
Zinc, 5000 lb & over	17.5¢ to 30.7¢

WARE-HOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.64	8.97	9.05	9.01	10.68	.....	.....	.....	.....
Baltimore	$.10	8.38	8.98	9.71	8.86	8.76	9.29	9.16	11.44*	16.18	15.18	19.73	18.98
Birmingham	.15	8.18	9.45	10.15	8.23	8.56	8.64	8.60	10.57	.....	.....	.....	.....
Boston	.10	9.48	10.54	11.55	9.52	9.82	9.73	9.83	13.00	15.79	15.38	19.89	19.18
Buffalo	.15	8.40	9.15	11.22	8.65	9.05	9.05	8.95	11.05*	16.34	15.15	19.01	18.95
Chicago	.15	8.35	9.60	10.25	8.38	8.71	8.79	8.75	8.95	15.80	14.80	19.35	18.60
Cincinnati	.15	8.49	9.65	10.20	8.69	9.08	9.33	9.07	9.46	15.61	15.11	18.96	18.91
Cleveland	.15	8.33	9.60	10 35	8.48	8.94	9.16	8.84	10.95*	15.89	14.89	19.44	18.96
Denver	.20	9.70	11.30	12.49	9.80	9.70	9.80	9.98	10.65	.....	.....	.....	17.60
Detroit	.15	8.58	9.85	10.60	8.73	9.06	9.33	9.05	9.30	15.46	15.06	18.81	18.86
Houston		7.45	8.75	.....	7.60	8.05	7.60	7.55	11.10	16.20	.....	19.30	19.05
Kansas City	.20	9.02	10.27	10.82	9.05	9.38	9.46	9.42	9.87	20.02	15.47	20.02	19.27
Los Angeles	.10	8.60**	10.85	11.75	8.65	8.65	8.70	8.65	13.35*	17.05	16.10	21.05	20.35
Memphis	.15	8.55	9.80	.....	8.60	8.93	9.01	8.97	12.11*	.....	.....	.....	.....
Milwaukee	.15	8.48	9.73	10.38	8.51	8.84	9.00	8.88	9.18	15.43	14.93	18.78	18.73
New York	.10	8.97	10.23	10.66	9.41	9.53	9.45	9.67	12.86*	15.02	15.19	18.42	18.99
Norfolk	.20	9.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia	.10	8.10	9.00	9.97	8.79	8.87	8.60	8.75	11.61*	15.61	15.11	18.96	18.91
Pittsburgh	.15	8.33	9.60	10.60	8.48	8.71	8.79	8.75	10.95*	15.80	14.80	19.35	18.60
Portland		8.50	11.20	11.55	9.05	8.30†	8.65	8.65	14.50	18.50	16.10	20.75	20.25
San Francisco	.10	9.45	10.85	11.10	9.55	9.70	9.60	9.80	13.10	17.05	16.10	21.05	20.35
Seattle		9.95	11.15	12.00	10.00	9.70	9.80	10.80	14.05	16.55	16.35	20.65	20.15
Spokane	.15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.20	.....	17.35	21.55	21.05
St. Louis	.15	8.69	9.94	10.61	8.74	9.08	9.25	9.12	9.58	15.66	15.16	19.01	18.96
St. Paul	.15	8.94	10.19	10.86	8.99	9.45	9.53	9.37	9.81	.....	15.26	.....	19.06

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** All sizes except 18 and 16 gage.
†† 10¢ zinc. ‡ Deduct for country delivery. † 3/16 in. to ½ in. * C1018—1 in. rounds.

(Effective March 10, 1958)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.795	T-1
18	4	1	—	5	2.50	T-4
18	4	2	—	—	1.96	T-2
1.5	4	1.5	8	—	1.155	M-1
6	4	3	6	—	1.545	M-3
6	4	2	5	—	1.30	M-2
High-carbon chromium					.925	D-3, D-5
Oil hardened manganese					.475	O-2
Special carbon					.36	W-1
Extra carbon					.36	W-1
Regular carbon					.305	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*A3, J2, L4, C4*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
Stainless Type	302				37.50
	304	37.95	42.25	46.70	40.00
	316	44.40	49.50	54.50	58.75
	321	40.05	44.60	49.30	47.25
	347	42.40	47.55	52.00	57.00
	405	29.85	33.35	36.85	.....
	410	29.55	33.10	36.70	.....
	430	29.80	33.55	37.25	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 40.25; 1 side, 33.95.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.525	6.50	6.975	.....	.....	.....	14.75
Cleveland *R3*	.....	.....	.....	9.75	.....	.....	.....
So. Chicago *R3*	.....	.....	.....	.....	.....	.....	.....
Ensley *T2*	5.525	6.50	.....	9.75	.....	6.60	.....
Fairfield *T2*	.....	6.50	.....	.....	.....	.....	.....
Gary *U1*	5.525	.....	.....	9.75	.....	6.60	.....
Huntington *C16*	.....	6.50	.....	.....	.....	.....	.....
Ind. Harbor *I3*	5.525	.....	6.975	9.75	.....	6.60	.....
Ind. Harbor *Y1*	.....	.....	.....	9.75	.....	.....	.....
Johnstown *B3*	.....	6.50	.....	.....	.....	.....	.....
Joliet *U1*	.....	.....	6.975	.....	.....	.....	.....
Kansas City *S2*	.....	.....	.....	9.75	.....	.....	14.75
Lackawanna *B3*	5.525	6.50	6.975	.....	.....	6.60	.....
Lebanon *B3*	.....	.....	6.975	.....	14.50	.....	14.75
Minnequa *C6*	5.525	7.00	6.975	9.75	.....	6.60	14.75
Pittsburgh *P5*	.....	.....	.....	.....	.....	.....	14.75
Pittsburgh *J3*	.....	.....	.....	9.75	.....	.....	.....
Seattle *B2*	.....	.....	.....	10.25	.....	6.75	15.75
Steelton *B3*	5.525	.....	6.975	.....	.....	6.60	.....
Struthers *Y1*	.....	.....	.....	9.75	.....	.....	.....
Torrance *C7*	.....	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.50	.....	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	9.75	.....	.....	.....

COKE

Furnace, beehive (f.o.b.) Connellsville, Pa.	Net-Ton $15.00 to $15.75
Foundry, beehive (f.o.b.)	$17.50 to $19.00
Foundry oven coke	
Buffalo, del'd	$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Is., Pa.	29.25

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1958 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	.....	9.625	
Armature	11.10	10.85	11.35
Elect.	11.80	11.55	12.05
Special Motor	.....	12.10	
Motor	12.90	12.65	13.15
Dynamo	13.95	13.70	14.20
Trans. 72	15.00	14.75	15.25
Trans. 65	15.55		
		Grain Oriented	
Trans. 58	16.05	Trans. 66	20.20
Trans. 52	17.10	Trans. 80	19.20
		Trans. 73	19.70

Producing points: Beech Bottom (*W5*); Brackenridge (*A5*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unbored.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	26.00	40	100, 110	10.70
20	72	25.25	35	110	10.70
18	72	25.75	30	110	10.85
14	72	25.75	24	72 to 84	11.25
12	72	26.25	20	90	11.00
10	60	28.00	17	72	11.40
10	48	28.50	14	72	11.85
7	60	28.25	12	60	12.95
6	60	31.50	10	60	13.00
4	40	35.00	8	60	13.30
3	40	37.00			
2½	30	39.25			
2	24	60.75			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$135.00
No. 1 Ohio	120.00
Sec. Quality, Pa., Md., Ky., Mo., Ill.	120.00
No. 2 Ohio	103.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	21.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$150.00
Childs, Hays, Pa.	155.00
Chicago District	160.00
Western Utah	175.00
California	180.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	157.00-160.00
Silica cement, net ton, bulk, Latrobe	28.50
Silica cement, net ton, bulk, Chicago	25.50
Silica cement, net ton, bulk, Ensley, Ala.	26.50
Silica cement, net ton, bulk, Mt. Union	24.50
Silica cement, net ton, bulk, Utah and Calif.	37.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$105.00
Standard chemically bonded, Curtiner, Calif.	115.00
Burned, Balt.	99.00

Magnesite Brick

Standard Baltimore	$131.00
Chemically bonded, Baltimore	116.00

Grain Magnesite

St. ⅝ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk.	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$16.75
Midwest	17.00
Missouri Valley	15.00

(Effective March 10, 1958)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢ lb.
Alabama City *R3*	173	187		212	193	8.65	9.20
Aliquippa *J3***	173	190			190	8.65	9.325
Atlanta *A8***	175	192		214	198	8.75	9.425
Bartonville *K2***	175	192	178	214	198	8.75	9.425**
Buffalo *W6*	.....	.....	.....	.....	.....	8.65	8.95*
Chicago *N4****	173	190	172	212	196	8.65	9.325
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	8.65	.....
Crawf'dsv. *M4***	175	192		214	198	8.75	9.425
Donora, Pa. *A5*	173	187		212	193	8.65	9.20
Duluth *A5*	173	187		212	193	8.65	9.20
Fairfield, Ala. *T2*	173	187		212	193	8.65	9.20
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192		217	198	8.90	9.45
Jacksonville *M4*	184	197		219	203	9.00	9.675
Johnstown *B3***	173	190	172		196**	8.65	9.325**
Joliet, Ill. *A5*	173	187		212	193	8.65	9.20
Kokomo *C9**	175	189		214	195*	8.75	9.30*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.60	10.275
Kansas City *S2**	178	192		217	198*	8.90	9.45*
Minnequa *C6†*	178	192	177	217	198†	8.90	9.45†
Monessen *P6*	.....	.....	.....	.....	193	8.65	9.20
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	8.95	9.50*
Pittsburg, Cal. *C7*	192	210			213	9.60	10.15
Rankin, Pa. *A5*	173	187			193	8.65	9.20
So. Chicago *R3*	173	187			193	8.65	9.20
S. San Fran. *C6†*	.....	.....		236	.....	9.60	10.15†
Sparrows Pt. *B3***	175	.....		214	198	8.75	9.425
Sterling, Ill. *N4****	175	192	172	214	198	8.75	9.425
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.30
Worcester *A5*	179	.....	.....	.....	.....	8.95	9.50
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢.
** 11-12¢ zinc.
*** .10¢ zinc.
† Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Baltimore, Md. *T8*	9.50	10.40	12.60	15.60	18.55
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *C4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	.....	.....
Franklin Park, Ill. *T8*	9.05	10.25	12.45	15.45	18.40
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *J3*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Pittsburgh *S7*	8.95	10.40	12.60	15.60	18.55
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *J3*	8.95	10.40	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
National Tube	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
Pittsburgh Steel	2	13	36.34	42.56	.....
	2½	12	48.94	57.31	.....
	3	12	56.51	66.18	.....
	3½	11	65.97	77.25	.....
	4	10	87.61	102.59	.....

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	.....
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	.....
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	66.50	67.00	67.50	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R5*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50	.....	.....
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.00	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	66.50	67.00	67.50	.....
Sharpsville *S3*	66.00	66.50	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	.....
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	74.00
Youngstown *Y1*	.....	.....	66.50	67.00	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel.

Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $84.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	32.00	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	37.75	33.75	34.25	34.25
Plates	44.25	45.00	46.25	47.25	50.00	50.75	76.75	59.75	69.75	40.25	35.00	36.75	36.00
Sheets	48.50	49.25	51.25	52.00	—	55.00	80.75	65.50	79.25	48.25	40.25	—	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	—	55.00	80.75	65.50	79.25	48.25	40.25	—	40.75
Wire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.25	52.50-52.75	61.50	35.75	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J2*, Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R5*; Harrison, N. J., *D3*; Youngstown, *J3*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (plus further conversion extras); *W1*; New Bedford, Mass. (.25¢ per lb higher), *R6*; Gary, *U1* (.25¢ per lb higher).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*, Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*, Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R5*, S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*, *R3*; Ft. Wayne, *I4*; Detroit, *R5*; Gary, *U1*; Owenboro, Ky., *G5*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.
Structurals: Baltimore, *A7*; Massillon, O., *R5*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R5*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*; Owenboro, Ky., *G5*.

(Effective March 10, 1958)

A. J. BOYNTON AND CO.
CONSULTING ENGINEERS
109 N. Wabash Ave., Chicago 2, Ill.

for Corrugating and Complete Line of Culvert Equipment—Slitting and Coiling Equipment for Ferrous and Non-Ferrous Material in All Capacities—Warehouse and Steel Mill Cut to Length Lines for Shearing and Levelling Sheets from Coils—Shears for Shearing Sheets and Plates Both Underdriven and Overdriven Types in Capacities to 1¼" Plate.

STAMCO, Inc., New Bremen, Ohio

FORGINGS

ALL SIZES, pressed . . rolled . . extruded . . forged to accurate specifications from carbon, alloy, stainless steels and special metals. Modern metallurgical, die, heat-treating and rough machining facilities.

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MULTIPLE SPINDLE
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UP TO ½" IN STEEL 60" WIDE

The most productive and modern perforating equipment in the world is at your service when you deal with Accurate. This means lowest cost—precision perforating. Versatile Accurate Perforating has hundreds of dies ready for service—and is equipped to develop unlimited patterns. Let us help you solve your perforating problems. Write for our FREE catalog #6.

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perforating company
3632 SOUTH KEDZIE AVENUE • CHICAGO 32, ILLINOIS

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C....	41.00	0.50% C....	38.00
0.05% C....	39.00	1.00% C....	37.75
0.10% C....	38.50	1.50% C....	37.50
0.20% C....	38.25	2.00% C....	37.25

4.00-4.50% C, 60-70% Cr, 1-2% Si.. 28.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 27.50
0.025% C (Simplex) 36.75
0.10% C, 52-57% Cr, 2.00% max Si. 37.50
7-8½% max C, 50-55% Cr, 3-6% max Si 25.00
7-8½% max C, 50-55% Cr, 3% max Si 25.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C $1.31
0.50% max. C 1.31
9 to 11% C, 88-91% Cr, 0.75% Fe... 1.40

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads $1.29
Ton lots 1.31
Less ton lots 1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads	27.50	14.20
Ton lots	32.75	15.65
Less ton lots	34.35	17.30

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Ca, 60-65% Si, 3.00 max. Fe.

Carloads 25.65
Ton lots 27.95
Less ton lots 29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads 24.25
Ton lots 26.15
Less ton lots 27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots 21.15
Less ton lots 22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots 17.20
Ton lots 18.70
Less ton lots 19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed 18.50
Ton lots to carload packed 19.65
Less ton lots 20.90

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Neville Island, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk 14.80
Ton lots packed 17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed 45.75
Ton lots 47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads 34.00
Ton lots 36.00
250 to 1999 lb 38.00
Premium for Hydrogen - removed metal 0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk 12.80
Ton lots, packed 14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet 15.10
Ton lots, packed, pallets 16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots, packed	Carloads, packed
96.75% Si, 1.25% Fe..	24.20	22.90
98% Si, 0.75% Fe	24.95	23.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk 7.70
Ton lots, packed 10.50

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	14.20	75% Si....	16.40
65% Si....	15.25	85% Si....	18.10
	90% Si....	19.50	

Ferrovanadium

50-55% V delivered, per pound, contained V, carloads, packed.

Openhearth 3.20
Crucible 3.30
High speed steel (Primos) 3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots..	2.40	3.30	4.55

(Effective March 10, 1958)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads ..... 10.65¢
Ton lots ..... 11.80¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.28

Ferrocolumbium, 50-50%, 2 in. x D, delivered per pound contained Cb.

Ton lots $4.90
Less ton lots 4.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Sb plus Ta $4.25

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.68

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload $110.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $240.00

Ferrotungsten, ¼ x down packed, per pounds contained W, ton lots delivered ..... $2.60 (nominal)

Molybdic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa. $1.41
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump ..... 18.50¢
Ton lots, packed lump ..... 20.50¢
Less ton lots ..... 21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 .... $1.38

Zirconium, per lb of alloy

35-40% f.o.b. freight allowed, carloads, packed ..... 27.25¢
12-15%, del'd lump, bulk-carloads ..... 9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload $5.50

Bortram, f.o.b. Niagara Falls.

Ton lots per pound ..... 45¢
Less ton lots, per pound ... 50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots, F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up $1.20
10 to 14% B ..... .85
14 to 19% 1.20
19% min. B 1.50

Graninal, f.o.b. Bridgeville, Pa., freight, allowed, 100 lb and over

No. 1 ..... $1.05
No. 79 ..... 50¢

Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots $1.46
Less ton lots 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

This beautiful, new overpass erected at Winthrop, Maine has sidewalk railings made of Continuous Weld Yoloy Steel Pipe. Yoloy's extra strength and excellent corrosion-resistance are qualities required for applications of this type.

"Yoloy" pipe is on the job

. . . providing strong, corrosion-resistant bridge railings for Maine State Highway Commission

Maine chose Yoloy! It proved so easy to fabricate and weld that 2 additional Maine bridges will have Yoloy railings. This nickel-copper alloy steel also demonstrates added strength and longer life making it an ideal structural pipe!

Available in Sheets, Plates, Bars, Shapes, Cold Drawn Bars and Tubular Products, Youngstown's complete family of Yoloy steels provides the right grade for each of your specific jobs. Complete informative Data Sheets on each Yoloy steel will be sent you promptly upon request.

OVERPASS AT WINTHROP, MAINE ERECTED FOR THE BRIDGE DEPARTMENT OF MAINE STATE HIGHWAY COMMISSION. YOLOY PIPE WAS SOLD THROUGH JOBBER W. L. BLAKE CO., PORTLAND, MAINE, TO BANCROFT & MARTIN ROLLING MILLS CO., SOUTH PORTLAND, WHO FABRICATED THE BRIDGE RAILINGS. CIANCHETTI BROS., INC., PITTSFIELD, MAINE, ERECTED THE SECTIONS FOR GENERAL CONTRACTOR H. E. SARGENT, INC., STILLWATER, MAINE.

PHOTOS COURTESY OF MAINE STATE HIGHWAY COMMISSION

THE YOUNGSTOWN SHEET AND TUBE COMPANY
Manufacturers of Carbon, Alloy and Yoloy Steel
General Offices - Youngstown 1, Ohio
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QUALITY YOUNGSTOWN SERVICE

WRITE FOR THESE FREE PAMPHLETS IN THE YOLOY FAMILY SERIES:

YOLOY "E"	HIGH STRENGTH-LOW ALLOY STEEL-STANDARD APPLICATIONS
YOLOY	HIGH STRENGTH STEEL-SPECIAL APPLICATIONS
YOLOY "S"	HIGHER STRENGTH STEEL FOR INCREASED SERVICE LIFE
YOLOY "C"	CORROSION RESISTANT GRADE FOR DEEP FORMING
YOLOY PIPE	CONTINUOUS WELD FOR CORROSION RESISTANT APPLICATIONS

ELECTRICAL POWER EQUIPMENT IN STOCK

DC MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	3000	New Elliott	Enc. F.V. d. arm.	475	320
2	3000	New Whse.	Enc. F.V. d. arm.	525	600
1	2250	New Elliott	Enc. F.V. d. arm.	600	282/300
1	2200	G.E.	MCF	600	480/500
1	1750	New Elliott	Enc. F.V. d. arm.	250	175/350
1	1500	Whse.	Enc. F.V. B.B.	525	600
4	1500	Whse.	Enc. F.V.	525	600
1	1875	G.E.	MCF	415	1500
1	1300	G.E.	MCF-13	300	200/400
1	1200	G.E.	MCF	600	450/600
1	1000	Whse.		500	800/2000
1	940	Whse.	GM	250	140/170
2	800	G.E.	MCF	250	400/750
2	750	G.E.	MCF	600	450/900
1	750	G.E.	MCF	600	300/720
1	750	G.E.	MCF	600	120/360
4	600	Whse.		250	275/550
1	500	G.E.	TLF-3656H B.B.	250	2000/3600
1	500	G.E.	MPC-10	250	188/400
3	450	Whse.		550	415
2	400	G.E.	CY-275	300	1000/1500
1	300	Cr.Wh.	H-102 B.B.	230	1200
2	300	G.E.	MCF-4	250	190/380
2	300	G.E.	MPC	230	400
2	275	G.E.	TLC-108 B.B.	250	2000/4000
1	250	G.E.	MDP-614AE	425	950
1	225	G.E.	TLC-110 B.B.	250	1150/3600
1	200	Whse.	CR207.4	250	800/1200
1	150	Cr.Wh.	CMC-85H	280	1150
1	150	G.E.	CD. B.B.	600	250/750
1	150	G.E.	TLC-74 B.B.	250	1150/3500
1	120	G.E.	TLC-50 B.B.	250	1950/5000
1	125/150	Whse. New	CB-210.3	230	300/1200
1	120	Rel.	1050T B.B.	230	575/900
2	125	Whse.	SK-190	230	450/1200
1	125	Whse.	SK-185	230	850/1050
1	100	G.E.	CDP-115	230	1750
2	100	Whse.	SK-181	230	450/1200
1	75	G.E., B.B.	CD-1235 D.P.	600	850
6	40	Rel. B.B.	385F, TEFC	230	500/1500

MERCURY ARC RECTIFIERS

3—150 KW, G.E., Sealed Tube Ignitron Unit Substation load centers 275 V. D.C., 2300 V. A.C. Pyranol filled transformers complete.
2—150 KW, G.E., Ignitron, 245 V. D.C.—220 V. A.C., air cooled transformers with controls.

MG SETS—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	DC Volts	AC Volts
1	2000	G.E.	514	600	2300/4600
2	1750/2100	G.E.	514	250/300	2300/4600
1	1500	G.E.	720	600	6600/13800
1	1500	G.E.	600	600	2300/4150
2	1000	G.E.	720	600	6600/13200
2	750	G.E.	720	250/300	6600/13200
1	500	Whse.	900	125/250	440
1	500	G.E.	900	125/250	440
1	350	G.E.	900	125	440/2300/4160
1	350	G.E.	1200	250	2300/4000
1	300	G.E.	1200	250	440/2300
1	250	Whse.	1200	250/275	2300
1	200	G.E.	1200	250	440/550
1	200	Whse.	1200	250	2300
1	200	El.Mfg.	1200	250	2300/4000
1	150	G.E.	1200	275	2300
1	150	Whse.	1200	275	2300
1	150	G.E.	1200	125	440
1	140	Cr.Wh.	850	125/250	2300
1	160	G.E.	1170	250	220/440
1	100	Cr.Wh.	1800	240	440
2	140	Cr.Wh.	1140	525	220/550
1	100	G.E. (unused)	1200	250	2400/4160
3	75	Whse.	1200	125	440

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
3	3333	Whse.	OISC	1	13800 x 2300
1	1500	G.E. auto	HT	3	4000/4200/4600
3	1000	G.E.	HVDDJ	1	2400 x 480
2	1000	G.E.	OA/FA	1	13800 x 230/460
3	750	G.E.	Pyranol	1	4800x455/55-355/165
3	500	Kuhl	OISC	1	12500 x 5650
3	333	G.E.	OISC	1	13200 x 2350/4330Y
3	150	G.E.	OISC	1	55,000x2300/4000Y
3	100	Whse.	SK	1	4400x440/230/115

CRANE & MILL MOTORS

230 V., D.C.

Qu.	H.P.	Make	RPM	Type
14	12/15	Whse.	700/800	MCA-30, Series
1	20	Whse.	975	K-2, Series
9	20	G.E.	850	MD6-608-AE-2 wh.
2	25	G.E.	725	CO-1808, Series
1	25	Whse.	480	CK-9 Comp. S.B.
1	35	Whse.	480	CK-9 Sh. R.B.
1	45	Whse.	600	CK-9 Comp. S.B.
2	50	G.E.	650	COM-1830 Comp.
3	50	Whse.	525	CK-9 Shunt R.B.
2	50	Whse.	600	CK-9 Comp. R.B.
1	50	G.E.	550	MD-412AE 2 Comp. R.B.
1	80	Cr.Wh.	550	SW-50 Comp.
1	100	G.E.	475	CO-1832 Series S.B.
6	100/140	Whse.	500/615	MC-90 Series R.B.
9	125	G.E.	625	CO-1832 Series S.B.

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Better Inquiry Rate Cheers Pittsburgh

Used machinery dealers there report more interest in tools, fabricating equipment and electrical machinery.

Steel mill equipment continues off and dealers are building up inventories.

▪ Pittsburgh dealers report a pickup in inquiries for tools, fabricating equipment, and electrical machinery.

Domestic inquiries for steel mill equipment are off. Sales of all types of equipment are still lagging.

No one is going overboard in predicting an upturn but there is a better feeling among Pittsburgh dealers. "The phone has started ringing again," says one. His office had been very silent during December and January. Customers are still slow to place orders but they are at least out shopping again.

Machine Tools Still Slow—According to the same dealer, bending rolls, shears, press brakes, and other fabricating lines are attracting the greatest interest. Inquiries are coming from plants that are bidding on specific jobs; there is not much buying for general expansion. Judging by inquiries, there are a lot of jobs up for bidding.

Machine tools are not too active yet, although there have been some promising inquiries in recent weeks. One plant is shopping for a $100,000 batch of tools, including a 5-ft horizontal mill. Specifications call for equipment built in 1950 or later.

Different Viewpoint — Another firm is looking for four vertical-spindle, rotary type millers. There are only two manufacturers of this type machine and no units have been uncovered in the Pittsburgh district. Going to other areas, dealers find inquiries have already been circulated.

A slightly different view of the current situation is taken by a second dealer. For him, January was a fairly good month. Sales included a 10-ft boring mill and a large, rebuilt lathe. After an improvement in January, sales are back down to the low level of December and November.

Foreign Sales Better — Dealers are offering sheet mills, strip mills, bar mills, breakdown mills, levelers, straighteners, and a wide range of specialty mills. The supply improvement is not related to the steel slump, says one dealer. Most of the equipment coming on the market was scheduled for sale months ago.

Foreign inquiries for steel mill equipment are holding up better than domestic. Latin America continues to provide the most active market but inquiries also come in from India, Japan and the European countries.

Supplies Plentiful — A supplier of electrical equipment says inquiries are still coming in but that steel mills are doing little asking for buying. Coal mining operations are offering the liveliest market for compressors and power units.

Most types of electrical equipment are readily available. A year ago dealers would often get no response from their offers to buy. Now sellers are grabbing at the most tentative proposals.

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10' x 10" Ga. Bertsch Initial Type
10' x ⅜" King Pyramid Type
18' x 1" Niles Pyramid Type
BORING MILL—HORIZONTAL
Cincinnati Gilbert Model 3—4½" Dia. Spindle, 36" Travel, 38" x 54" Table—NEW 1956
BRAKE—PRESS TYPE
10' x ¼" & 12' x ⅜" Hydraulic—NEW
CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton P&H	56' Span	220/3/60
5 ton P&H	50' Span	115 Volt D.C.
5 ton Cleveland	60' Span	110 Volt D.C.
5 ton Shepard Niles	70' Span	230 Volt D.C.
8 ton P&H	55' Span	220/3/60
10 ton Shepard Niles	38' Span	440/3/60
10 ton Shaw	48' Span	230 Volt D.C.
10 ton Shaw	120' Span	230 Volt D.C.
15 ton Shepard Niles	58' Span	230 Volt D.C.
20 ton Shaw	28' Span	230 Volt D.C.
50 ton Northern	52' Span	440/3/25 A.C.
120 ton P&H	66' Span	220/3/60 A.C.
120 ton Shepard Niles	77' Span	220/3/60

CUT-OFF MACHINE
AC-2 Yoder, Motor Driven with 3 HP AC Motor
DRAW BENCHES
8,000# Waterbury Farrel Single Draw 20 Ft. Length of Draw
10,000# Aetna Standard Single Draw 44 Ft. Length of Draw
FLANGING MACHINE
¾" McCabe Pneumatic Flanging Machine
FORGING MACHINES
1" to 5" Acme, Ajax, National
FURNACE—MELTING
15 ton Heroult Top Charge, 12' Shell Complete with Transformers
HAMMERS—BOARD DROP—STEAM DROP—STEAM FORGING 800 lb. to 12,000 lb. incl.
HEADERS
#250C Manville Solid Die Single Stroke
#44 Waterbury Farrel DSOD Capy. ⅝" x 6"
LEVELERS—ROLLER
37" Torrington, 19 Rolls 131/32", dia.
28" Voss Chain Leveler, Capacity .025 to .075
PRESSES—HYDRAULIC
500 ton Watson Stillman 4 Col. Piercing Press
600 ton HPM Fastraverse, Bed 36" x 36"
600 ton Elmes, 36" Stroke, 48 x 45" Bet. Cols.
1500 ton Bliss 15" Stroke, Bed 49" x 48"
1500 ton Mesta Steam Hydr. Forging Press
4500 Baldwin-Lima-Hamilton Hydr. Forging Press
PRESS—KNUCKLE JOINT
600 ton Bliss No. 25, 2½" Stroke, Bed 24 x 29"
PRESSES—STRAIGHT SIDE
180 ton Hamilton #847, 12" Str. 35½" Bet. Ups.
200 ton Clearing F1200-42, Stroke 30", Bed 44"x38"
250 ton Bliss S1 7½ Str. Bistr. 33"x39"
PUNCH & SHEAR COMBINATIONS
Cleveland Style C, Arch. Jaw, Capy. ¾" x ¾"
Cleveland Style EF, Arch. Jaw, Capy. 1¼" x 1"
Cleveland Style G Single End, 60" Throat
Cleveland Style W, 60" Throat, Architectural Jaw
RIVETER
80 ton Hanna Bull Riveter 24" Gap, 10'6" Reach, Capacity 1¼" Rivets
TORRINGTON FLAT WIRE MILL LINE
Two Stand Two High 6" x 5", Comp. with Acc.
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8" x 10" Single Stand Two High
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12" x 16" Single Stand Two High
16" x 24" Single Stand Two High
20" x 36" Single Stand Two High
ROLLS—FORMING
6 Stand Yoder M-1½
14 Stand Yoder, 2½" Shaft, 30" Bet. Housings
18 Stand Custom Built, 2¼" Shaft, will take 36" wide
14 Stand Custom Built, 1⅞" Shaft x 14 3/16"
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SHEAR—ALLIGATOR
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42" Bliss Up-Cut Shear, Capacity .125" Max. With Hump & Run-out Tables
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STRAIGHTENER
24" Hallden Straightening & Cutting Machine
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Torrington 12-Roll Capy. 1¾" Sq., Etc.
No. OA Medart 2-Roll, Capacity ¼" to 1" Bars
No. O Medart 2 rolls, Capacity to 1¼" dia. Bars
No. O Sutton, Capacity 5/16" to ⅞" dia. Bars, ¾" to 1⅜" OD Tubes
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#6½A Fenn Capacity 3¾" Tube, 1¼" Solid.
10" Die Length Hydraulic Feed, LATE
WIRE DRAWING MACHINES
Type B Morgan 4-Block, Capy. #5 Rod down
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24" Cincinnati 4 spindle upright drill, spindle motor drive
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20" x 72" Landis type D heavy duty plain hydraulic cylindrical grinder
53" No. 24A Gardner vertical spindle horizontal disc grinder, 15 HP, multiple vee belt dr.
8" x 24" No. 35 Abrasive grinder
300 lb. No. 3C Chambersburg pneumatic forging hammer
2B Nazel forging hammer
4" bar Universal "Tri-Way" horizontal boring, milling and drilling machine
30" x 30" x 8' Cincinnati Hypro two rail, one right hand side head, dial feed planer
600 ton No. 664 Toledo tierod frame knuckle joint coining press
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600	West	CB	720
600	*G.E.	K-63455	1200
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500	*G.E.	I-13-E	900
350	*G.E.	KT-559-A	1800
300	*G.E.	K-6344	1200
250	*West (TE)	CS-81205	1800
250	*G.E.	KT-599-S	1800
250	*West	CS-875-9	1800
250	Brook	RS-28	1200
200	*G.E.	FT-549	3600
200	*G.E.	I-K-13B	1800
200	West	CSP-581-S	1800
200	Brook	RS-27	1200
200	*West	CS-998-A	900
200	G.E.	KT-564-S	720
200	*Al-Ch	AN-37-G	720
200	*West	CS-1010	600
200	Al-Ch	ARW-631	600
150	Cr-Wh	SC-149	3600
150	Al-Ch	AN-30-F	1200
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150	G.E.	I-K-15A	900
150	*West	CS	600

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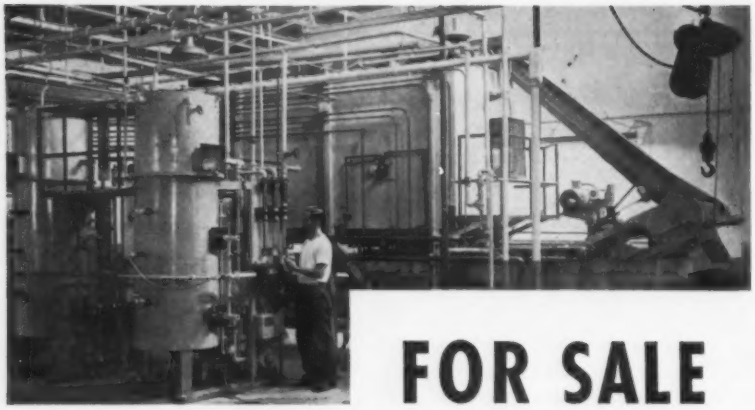

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18" Cast Conveyor Belt Furnace, General Electric Catalog #8026518G2 includes the following:

One complete set of installed heating elements (good to 1800°F.). One spare set of heating elements. Two 750 CFH Drycolene Producers with material to renew diaphragm, three retort tubes, and spare parts. One Tray Type Charging Machine. One spare rebuilt 18" cast belt. 800 gal. quench tank with 24" wide conveyor belt, oil circulating pump and aftercooler. One set of complete operating instructions.

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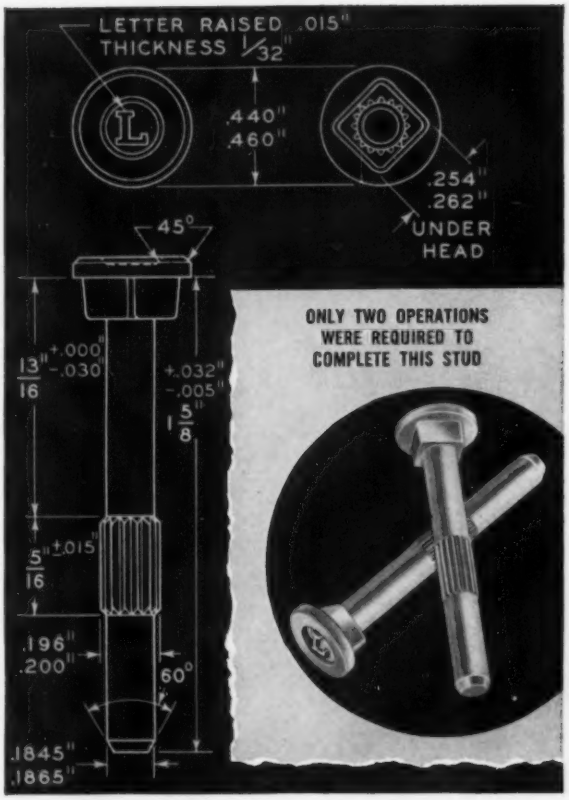

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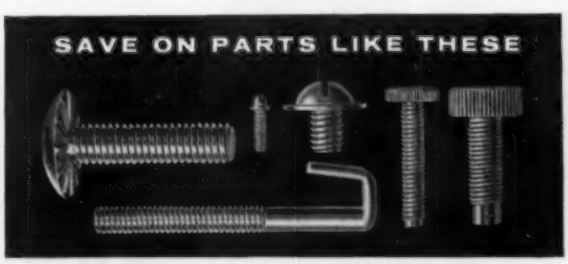

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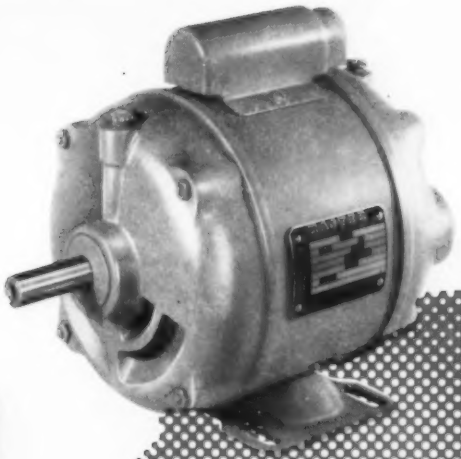

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